PELVIC AND HERNIAL THERAPEUTICS.

PRINCIPLES AND METHODS FOR REMEDYING CHRONIC AFFECTIONS OF THE LOWER PART OF THE TRUNK, INCLUDING

PROCESSES FOR SELF-CURE.

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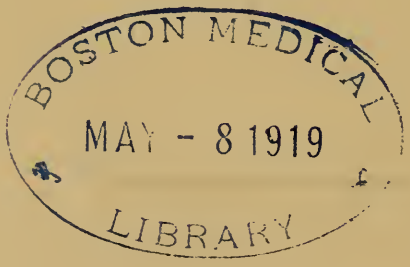

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PREFACE.

To simplify and render more intelligible the resources of the healing art; to enrich them by generous additions, from easily understood and applied principles of physics; to extend their scope; to include forms and stages of diseases heretofore only susceptible of palliation, would mark a highly desirable progress in medicine; and these are the ends sought in the following pages.

The facts of science, physical and physiological, as distinguished from the traditions of medicine, have been the guide in the development of the principles and methods embraced in this volume. This rather unusual circumstance will not, it is hoped, restrain the reader from applying the rigorous tests by which the scope and validity of all matters of practical beneficence must ultimately be decided—the tests of experience. And he may be encouraged by the fact that, the value and trustworthiness of the methods described have been well verified by critical and competent observers, whereby also, such crude and untenable matters as are liable to be connected with radical propositions have been well eliminated.

While perfection is not claimed for this work, it is confidently believed to contain much that is of value, if not indispensable, for the Physician, the Invalid, and the scientific Inquirer, and it is therefore commended to their careful consideration.

G. H. Taylor, M.D.

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PART I.

PRINCIPLES.

I.

INTRODUCTORY.

Causes and Effects; Remedies and Palliatives in Chronic Affections of the Lower Portion of the Trunk.

Morbid phenomena, especially those usually designated chronic disease, are regarded in one of two general ways. As these modes of estimating often lead to differing, even to opposing remedies for what is essentially the same morbid condition, it becomes important that the proper distinctions between these modes should be made.

One way of estimating disease is that adopted by the patient and by sympathizing friends, and doubtless influences the physician to a large extent. This estimate is based upon subjective facts—what the patient feels, sees, and experiences. It includes his consciousness of defect of power and excess of sensibility, and the accompanying exterior manifestations.

Remedies are therefore sought in accordance with these conceptions, and include prominently whatever means may be capable of mitigating, or even abolishing, disagreeable sensations, or at least the consciousness thereof, often with little reference to the source from which those feelings spring.

The invalid, unfortunately for his own true interests, is disinclined to discriminate between the two distinct ideas of suffering and of disease. He blends the two as one. This leads to the radical mistake of trying to cure the one by causing suspension of the other. He seems to think that pain is causing him injury, instead of referring it to the morbid action from which the pain is derived. It is not the pain,—which is doubtless on the whole advantageous,—but its causes, which demands correction.

It is therefore with difficulty that the invalid learns that while this and other subjective manifestations are undoubted verities, they alone are untrustworthy indications as to remedies, because incomplete indications of disease. The facts of pathology are far more extended, and all, not a part, are required as a basis for any proper remedial prescription. Too close reliance on sensory indications inevitably leads to therapeutic difficulties. These consist in the mistakes of trying to remedy mere effects in place of removing their causes.

Another consequence of undue regard to the subjective indications of disease, is the premature arrest of diagnostic inquiry. Further investigation, as the tracing of effects to their causes, is discouraged ; the idea of philosophical relationships of seen and unseen facts is repressed, and the advantages to therapeutics of such inquiries become unavailable. The physician is guided by only a limited number of subordinate facts, which, being isolated from their true connection, are untrustworthy.

A still further difficulty, usually indirectly expressed, arising from the above stated sources of misconception, is the tendency in the popular mind to associate, in idea, defects of the vital organism with those of non-vital objects. Diseased manifestations are thought to be like something broken, requiring local repair by trained and dexterous hands. The remedy must accord with the imme-

diate, patient, and obtrusive difficulty, as a broken implement is mended. Medical science is limited to the record of experience in correcting local faults of the organism and insufficiently correlates with science in its wider aspect.

The defects of this mode of regarding chronic disease, and the practical therapeutic errors to which it inevitably leads, will be shown in succeeding chapters in connection with such affections as those pertaining to the pelvis and adjacent parts. These errors are so surprising, and so easily detectable, that it is a wonder that the medical profession, trained to great acuteness in pathological observation, should not have long ago insisted on their correction.

The other mode of estimating chronic disease in reference to remedies, regards its ordinary manifestations as only symptoms, products, and evidences of antecedent causes, without which such manifestations would be impossible. It therefore assumes that however distant and obscure these causes, they are the primary objects of medical interest, and of remedial attention. The actual departure from health is a *process* rather than a *product.* The objective phenomena are a cumulative record of transitional defects and errors. The physician points out and corrects these, and the consequences, however manifested, cease perforce. Nothing exists, not even local disease, after the withdrawal or cessation of the processes whereby it exists.

This is the physiological method. This method regards health and disease as flowing from essentially identical sources, the difference consisting solely in the degrees of perfection attained by the inchoate activities at the ultimate sources of vital power. Remedies are therefore concerned in the control of processes, rather than in obscuring the effects and products of these processes. The processes of physiology embrace the whole career of matter entering the organism, onward to its final exit. During this transit it is subjected to a series of changes, and a variety of differentiations in physi-

cal quality and form, for the sole ultimate purpose of evolving force or energy. The processes of physiology are minute, involving not merely the tissues of every part, but the ultimate molecules, and constituent elements, beyond the powers of ordinary observation; these may, but often do not, make an impression on the consciousness or sensibilities.

In the diseased state (indicated in medical science by the word pathology) there is the same career of the same matter, but under conditions less favorable for the attainment of perfected results. The changes due have in some stage of the career been imperfectly attained. In some local part, or by some inferior physical change, the progressing matters have failed to yield energy; and *therefore*, and coincidently, failed to attain the chemical form necessary for exit. The product, both of energy and of substance, depend on processes in the respective organic instruments devoted to these purposes. Pathology, therefore, has its potential existence in transitional acts, rather than in the form which the consequences of the imperfection of these acts assume. The distinction should always be made between the effects, consequences, and products of imperfect physiological processes, and the processes from which these evidences proceed. It is the former of which we are chiefly cognizant, because more exposed to observation; they are exterior and objective, and often present a cumulative mass. The latter are interior, elusive, and known by comparison and by the reasoning faculties.

These considerations unmistakably imply a wide distinction between the inward, invisible and intangible form of disease, irrespective of the sensation, and the consequences thereof as exhibited in objective phenomena. The one is continuously contributing, by the changes occurring in successive particles of substance, to produce and maintain the other; the relation of cause and effect being precisely the same as that recognized as resulting in health. Pathology therefore exists

less in the formed product than in its forming. The impressions of consciousness may or may not exist, according to the nature and location of the imperfect process, and are always to be classed with the objective phenomena, or formed products, so far as relates to therapeutics. It is therefore a profound mistake to merge together as an undistinguishable whole two considerations so radically distinct as cause and effect, antecedent and consequent, process and product, in pathology; and such confusion of separate and different things inevitably introduces into practical therapeutics the gravest inconsistencies and mistakes.

The adequate comprehension of disease therefore considers it in the two aspects above presented. These for convenience may be styled the antecedent and the resultant *factors*, meaning the defective processes, and the cumulative products.

The susceptibility of the two distinct parts of pathological phenomena to separate consideration arises from the nature of vital processes, of which disease is but a form. These processes are progressive, and never concluded as long as life lasts. It probably extends throughout all the forms and variations of these processes, which receive distinct names, according to subordinate peculiarities. The evidence of this statement is derived from a variety of sources.

Prophylactics, or the means of prevention of diseases, emphatically recognizes an antecedent principle and antecedent action. The malarial infections, zymotic and incubative affections generally, are confessed demonstrations of the same principle; and the same is legitimately inferred of acute affections having obscure sources through no less positive manifestations, but whose processes and products are so blended as regards time, that the distinction has less practical therapeutic value.

The failure to recognize the distinction above pointed out as to antecedent and resultant parts or factors of diseases,

opens the way for the perversion of therapeutics from its greater to its lesser uses. Remedies addressed to the resultant, or consequent object, are necessarily only palliative, and in general can have no effect on the contributive factors. The abatement of pain, one of the consequences of the morbid, or unperfected process, easily becomes the primary, instead of an incidental purpose. The sufferer is countenanced in his delusion that pain is something synonymous with disease, and that the latter disappears with it. Besides, a practical error of still more serious import is committed. The advantages of pain as a pathological guide are lost. Another and very disadvantageous consequence arises from medicating the sources of sensibility, which should not be the therapeutic purpose. These sensory powers are inevitably perverted by the constant use of remedies adapted to diminish pain, without paying attention to its causes. The nervous system is therefore liable ultimately to become an overwhelming factor, additional to the primary ones.

The relations of the antecedents to the resultants in pathology are necessarily those of equality, because effects must proceed from adequate and therefore an equal cause; but this fact does not imply interchangeability, but the contrary. The latter always depends on the former, and not the former on the latter. Remove the morbid processes by converting them into healthful processes, that is, into perfected morphological and chemical activities, and the morbid effects, however conspicuous, cease to exist. No radical curative effect is attainable, if therapeutic attention be limited to the resultant factors; such medication may be palliative, but is devoid of direct control of antecedent processes. However deftly the consequences be removed, nothing permanent is secured; the continuance of the producing factor is sure to reinstate the morbid result, however concealed, altered, or obscured to the senses.

An intelligent appreciation of the distinctions above made,

appears to be necessary to prevent medical practice from degenerating, as it is manifestly inclined, into a fruitless routine of palliative procedures. Methods of toying with the senses, and ways of disconnecting imperfect results from the elementary processes on which these results depend; devices in short for concealing these results mistakenly regarded as the disease, whether the manifestation be interior in the form of pain, or exterior in some outward tangible indication, as in the pelvis, or at the hernial border, assume unwarranted importance. The antecedents and the consequents, which are entirely distinct considerations, become inextricably mingled in therapeutics, and remedies adapted to radical cure, in the sense of correcting the primary departure from true physiological action, become impossible.

One of the leading obstacles to the recognition, and therefore the remedying of the primary factors of disease instead of the resultant factors, cannot be too strongly insisted on; one that imperils and often negatives the value of medical science. This is the avidity with which the lay public avails itself of all newly discovered modes of postponing and stifling pain, usually by means of lethean dosing. This practice is based on the presumption that the fact of pain is actually diminished by this class of so-called remedies. This is an assumption that is manifestly improbable; but, on the other hand, there is much evidence showing that symptoms relating to the seat of consciousness may thus be easily deferred, and possibly their location changed, yet the amount of pain, taking time into consideration, is actually often very greatly increased by the method invoked to stifle it. These statements are necessarily confined in their application to chronic affections; for it is readily conceded that in acute affections nature is at work, repairing defects, and gaining ground by intensifying compensative processes, in spite of the temporary interference of medicaments when these have no relation whatever to reparation.

The general correctness of the views here expressed in regard to primary and secondary facts of pathology which will be referred to as cause and effect, or antecedent and consequent phenomena, is verified by actual observation of chronic disease in general; but is most conspicuous and highly important in a therapeutic sense in cases of exterior manifestations of morbid effects. It appears to be assumed that when the consequences of defective physiology are exterior and visible, then exterior manifestations, and these only, are the sole objects of remedial treatment.

Deformities of the spine and of the limbs constitute a large class of cases of this kind. These exterior manifestations of mechanical shape are only the symbols of corresponding defects and irregularities of nutrition upon which form ultimately depends. Yet these effects have from time immemorial been regarded and treated as though they were primary affections, when in fact they are but consequences, and secondary. To repress such deformities by mechanical means only, which are capable of reaching no further than the exterior mechanical shape, even were this practicable, is obviously reversing the order of nature and the order by which the deformity appeared. The mechanical appearances are the result and product of corresponding nutritive defects—a difficulty to be corrected only by controlling primary nutritive acts; a principle to which the vital system is as susceptible in disease as in health; in disorder whose product is deformation, as in any other.

In those deformities in which local morbid action, as well as aberration of form appears, the same facts and reasonings are equally applicable. In angular curvature with vertebral inflammation, and in the joint diseases, the mechanical rectification is scarcely a part of the process of cure, and can never abate the actual morbid process, and must therefore be utterly deceptive in its effect. The actual disease con-

sists evidently in defect in the primary nutritive act; oxidation is not sufficiently intense in degree to become eliminative, and its unperfected products are consequently retained. The primary need is demonstrably something very different from the mechanical supports that are so pertinaciously substituted for remedies; these have no power to affect or control the disease in any direct and effective manner, scarcely even to mitigate the exterior form of the product of the disease. To put an end to the production of morbid material is to discontinue the consequences, and should be the primary remedial aim.

The above are mentioned as illustrations of the necessity of distinguishing between causes and results, antecedents and consequents in chronic disease.

It is, however, to another and entirely different class of sufferers who often, it might be said, usually fail to understand properly the sources of their difficulties, and therefore become the subjects of never ending palliation when it is far easier to be cured, to which the readers' attention is invited.

This class includes affections of the lower border of the abdomen, indicated by various forms of protrusion through the abdominal wall of some portion of the contents, and known as rupture or hernia.

It also includes the far more widespread class of affections of the contents of the pelvis. These affections may be merely mechanical, or they may be functional, or organic, or all these combined. Both sexes and every age are frequent subjects of the maladies included in this general classification.

The forms assumed by these affections are, in children, chiefly prolapse of the bowels through the rectal sphincter; loss of contractile power of the rectum; constipation.

In men, rectal prolapse, constipation, hæmorrhoids of all kinds, ulcerations, fissures, fistulas.

In women, the above mentioned affections, to which are superadded dislocations, prolapse, and deformities of the

uterus, and of the uterine attachments; also hyperæmia, and the unlimited varieties of its outgrowths, as neuralgia, dysmenorrhœa, tumors, functional troubles of all kinds, and the various progressed conditions of which hyperæmia is the first stage.

The somewhat unique principle is maintained in the following chapters, that the first condition of successful remedial treatment is a philosophical comprehension of the cause or causes of the malady, the etiology. This is the only thing that can save medical practice from the just charge of empiricism; and the only way in which the co-operation of the patient can be secured with certainty and effect is to show him that the best of remedies are barren of results, if so be the causes, so far as controlled by him, are not first obviated.

As regards the class of affections to be brought under review, the patient of even moderate capacity becomes quite capable of understanding the relation between antecedent and consequent, cause and effect, palliation and cure, because he can *experience* the distinction, he can feel it, and thus know it.

Not to delay the satisfaction of the reasonable desires of the interested inquirer, a brief summary of the principles to be explained in the following chapters is here given.

1. The mechanism, and especially the mechanico-physiology of the organism, provides within itself adequate conditions for maintaining the normal position, and the normal physiological or healthy state of the contents of the pelvis, and of the adjacent parts. It therefore contains adequate means for obviating the diseases which may occur in these parts.

This provision exists in all animals, more perfectly in man, both as a mechanico-physiological fact and as being under the control of intelligence, which renders its power far-reaching and irresistible.

2. This provision is *organic rhythm*, called also, from its more fully recognized function, the respiratory rhythm, which in health equally includes not only the digestive organs in the abdominal cavity, but also the contents of the inferior compartment or off-shoot of this cavity, that of the pelvis.

3. Observation and experience has demonstrated, and will constantly prove, that, in case of defective health of the contents of the pelvis, whether the defect be one of position or of condition, there is corresponding defective control of such position and condition by the physiological mechanism provided therefor; the defects of the two correspond in degree, whether the defect be one of sustentation, or any of the subordinate consequences; or of condition, and the progressive deviations proceeding from the primary fact. These defects, namely, of rhythmic action, which is mechanical, and of position and of condition, which are of mixed derivation and quality, correspond to each other, and sustain the relations of antecedent and consequent, cause and effect.

4. This constantly acting physiological mechanism is susceptible of very broad extent of variability, as is shown in the difference between its action in health and in the diseases specified. When the rhythmic function has been restricted for a prolonged period, and the capacity for its normal action has diminished, this capacity and action are easily susceptible of increase. Such increase may seem at first to be its exaggeration, but exaggeration becomes a remedy. It becomes the same action and has the same results in the condition superinduced in the pelvis, as would have existed if there had been no decline of powers.

The mechanical exaggeration of restricted normal action is curative; at least this is the general principle under which remedies are supplied to invalids.

The mechanical power and action described, manifested in reference to the position of the contents of the pelvis, and to the intestinal loups in contact with the pelvic organs and

the lower border of the walls of the abdomen, is herein designated *sustentation;* in reference to the hyperæmia of the pelvic organs or any portion thereof, it becomes a reliable and efficacious means for its removal.

5. No function of the vital organism can be more easily and immediately reënforced, by the supply of exterior power, than that of the variability of the dimensions and shape of the cavity of the trunk coincident with respiration, whereby the most difficult and profound questions of both medical and surgical therapeutics are solved. No function, also, is more susceptible of cultivation, and capable, when defective, of being by cultivation carried forward to the point of health, than this of rhythm. Such cultivation is the attainment of the perfection of therapeutics—demonstrates the supremacy of etiology, justifies the distinction between cause and effect, antecedent and consequent, palliation and cure, the obscurity attending which has been the bane of medical science.

6. The correctness and the practical feasibility of the medical and surgical application of the principle above stated are established by the following methods:

(1.) By the evidence afforded by the principles of ordinary physics involved in the relation of the morbid in comparison with healthful action of the mechanism of the trunk. This comparison indicates the adequacy of the mechanical insufficiency to produce the various consequences assigned to it.

(2.) By the evidence derived from physiological necessity, the observation of common physiological laws, and the comparison of the consequences of their insufficient with their sufficient action. These laws may be studied by observation of the inferior animals, and cannot fail to afford correct and valuable inferences.

(3.) By the evidence derived from therapeutic demonstration. This is conclusive and complete, and is available for any inquirer, medical or non-medical, so soon as the mechanical and the physiological principles involved are understood.

II.

Etiology and Diagnosis.

The morbid affections of the inferior portion of the trunk are a unit in mechanical location, and therefore have similar, often identical, mechanico-physiological relations. It follows that in so far as mechanical and mechanico-physiological forces control these parts, their pathological and therapeutic relations become practically identical.

The study of the facts pertaining to the region described is greatly facilitated by commencing with hernia. This is a visible, tangible, isolated and consequently indisputable form of manifestation, little liable to puzzle the student by assuming unique and deceptive forms. No one can mistake it for something else. It supplies the objective facts required for its identification.

The parts adjacent to a hernial protrusion, including both the exterior wall of the trunk and the interior visceral parts, sustain very nearly the same mechanical relations to their surroundings and to contiguous parts, are overlaid by the same mass of digestive organs, are supplied by similar branches of nutritive vessels; their waste and surplus is removed by similar venous connections operated by the same mechanism. It is also clear that though hernia may be manifested at only one or two points, yet the physical conditions superinducing it are very similar and very constant throughout the base of the trunk, and are by no means confined to the point of manifestation. The slightest local difference in the causes and the resistance to the causes contributing to its production, would vary the location of the effect and even the tissues in which such consequences might become manifested. To state these facts in other words, the manifestation resulting from the causes capable of producing it, may be hernia, or may go under some other name according to

local and transient circumstances; but being produced by the same causes would necessarily be amenable to similar remedies.

These statements respecting the influence of unity of causative or etiological facts upon diagnosis and therapeutics may be made clear by separating the physical from physiological considerations. If a vessel of fluid has a small opening at any part of its base it is plain that the outflow would be the same in amount and rapidity, as though it were located at any other point at the same distance from the surface of the contained fluid. And if the opening and outflow were concealed at the horizontal portion of the bottom, the physical condition would be unaltered, whatever modifications the stream might be subjected to immediately on its escape. This latter would be a subordinate circumstance, incapable of materially affecting the causes of outflow or the value of any rational contrivance adapted to prevent it.

So, too, the inferior portion of the trunk, considered in its merely physical aspect, is evidently liable to certain mechanical effects, which may become locally disadvantageous on the suspension of certain causes which ordinarily antagonize these effects. These may be manifested exteriorly to the pelvis, along the lower border of the abdomen, where they are open to physical observation, physical tests and physical antagonism. There is no obscurity as to the facts so far as determined by these tests. But such physical effects as displacement of viscera or some portion thereof may occur anywhere on the horizontal plane encircled by the exterior of the abdomen. These mechanical aberrations being interior, would be partially or wholly removed from direct observation, and indeed any complete and satisfactory physical test. Such mechanical interior changes at the locality designated would be further obscured by the nature of the organs themselves which become subjects of mechanical displacement; for these organs have complex functions, not at all indicated or sug-

gested by the phenomena attending exterior extrusion of a portion of the intestines which constitutes hernia. It is the obscurities attending location and function, and the relation of these to the organism, and their connection with the health and capacity for the manifestation of power or energy, that are cleared away by the study of hernia, whether as a pathological object, or in its remedial relations.

A soft swelling or tumor at some point at the lower border of the abdomen, usually painless, and remaining so with extraordinary exceptions—entirely disappearing on applying exterior pressure—to which a wave of motion is communicated through the viscera of the abdomen by a sudden sneeze, cough or unguarded exertion, and showing a tendency to increase of size, may be suspected as hernia.

The diagnosis is rendered certain only by determining the nature of the contents of the tumor. True hernia is a protruding loup or segment of intestine or omentum, or both, with its investments. Other swellings, occurring in the region, having similar exterior appearance, are confined to the tissues of the wall of the abdomen, and include no portion of its contents. Such swellings are like those common to other portions of the body, and may consist of lymphatic glands, inflamed or enlarged, local abscesses, or perhaps accumulated local fluids, causing the tissues to become distended.

The essential point in diagnosis is that true hernia is connected with interior or visceral organs, while swellings having an exterior resemblance are confined to the walls of the abdomen or local tissues.

Hernia therefore consists of a portion of the interior organs or contents of the abdomen out of place: and the contiguous abdominal wall, stretched out into a sort of sac, into which these contents are received.

The impressions of the popular mind respecting the nature of hernia are unfortunately restricted to those gained from occular and tangible evidence. Still more unfortunately the

medical conception of this affection has scarcely greater amplitude, as is proved by the nature of the therapeutic skill that is usually bestowed on it. This is still further proved by the absolute absence of preventive suggestions in reference to all affections of this class.

Hernia, as practically treated, is an incurable affection. The remedial attention it habitually receives belong to the palliative, not the curative, order of remedies. A hernied person usually remains indefinitely in the same condition. It is therefore evident that the remedy fails to touch the source of the affection, but deals simply and only with its consequences.

This misconception of the nature of hernia and its influence on therapeutics is the necessary result of neglect of its etiology. The affection, so long as regarded as appertaining solely to the local tissues, will appear to demand local remedies. So long as the local weakness of tissue of the abdominal walls, and the force operating from within the abdomen causing outward distention at the weakest point, are deemed inevitable and permanent conditions, no attempt can reasonably be made actually to cure the affection; it must only be combatted by exterior mechanical opposition, that is, by contra-pressure. The insufficient resisting power of the natural wall must be supplemented by art, and medical duties and responsibilities are supposed to be thus fully complied with.

A proper etiology of hernia and related affections does not end with the determination of the location, direction, forms, contents, and other peculiarities objectively manifested; nor even with the history of its apparent development and progress. It inquires into its sources, and assigns the relative value of the morbid causes which have been influential in its production. It recognizes a series of physiological deficiencies, which, by progressive increase, have culminated in the visible tangible affection. These physiological defects are therefore essential factors of the affection, whatever be

its form; the manifestation cannot, in any of its forms or varieties, exist without these precedent conditions. It is effectually cured by the removal of these causative factors.

INSUFFICIENCY OF LOCAL METHODS.

Affections of the hernial region indicated by protrusion of a portion of abdominal contents at the exterior base of the abdominal wall; affections of the contents of the pelvis, as prolapse of the bowel through its sphincter, inordinate distention and loss of contractile power of the rectum; piles, in all their varieties, ulcerations, etc.; affections of the contents of the female pelvis, as displacements, deformities, hyperplasias, and their alternatives; catarrh, and even ulceration, of some portion of the generative intestine, including also irregularities of function of this important portion of the female economy, with its associated shattered health and concomitant nervous phenomena—have become more and more subjects of specialization, both in regard to etiology and to remedial treatment, till this class of acquired affections have come to form an undue share of ordinary medical practice.

However much advantage may have occurred to medical science as a consequence of the more acute and discriminate study of localized disease, it is easy to see that this class of investigations are liable to, and have in some instances actually resulted in, serious detriment to the curative art. The difficulties in which local differential diagnosis involves the investigator, appear to have been overlooked as regard diseases of the inferior segment of the trunk, and the interests of both patient and physician require a brief statement of them.

Specialization in diagnosis tends to unequal appreciation of the constituents of disease. Those points receiving chief attention almost necessarily assume chief importance, and therefore have undue weight in the general estimate that may be made of the affection. The attention of the inquirer becomes

rooted to perhaps a single phase of the manifestation, which he easily conceives to be the ruling, if not the only factor of the affection. This result is in consonance with the natural powers of the average intellect, which does not easily permit of several collateral processes to go on at the same time.

It follows that while the minutest scrutiny may be bestowed on hernia, or the related pelvic manifestations, the inquirer fails to extend his observations to the causative phenomena, —fails indeed to recognize that the objects investigated are results, dependent for their existence on corresponding antecedent and causative facts.

This restriction of inquiry to salient and objective facts necessarily restricts therapeutics. True remedies include all the mutually dependent factors of the difficulty to be overcome. That which is applicable to a single phase of the affection may be far from adequate for the demands of the affection as a whole—indeed, may be detrimental. It may not only exclude the essential factors, but may seem to increase the morbid influence and its consequences. This is specially true, as we shall prove, of hernia; for its mechanical remedy not only neglects its causes, but actually increases their power and dominancy. And in the long list of diseases of the female pelvic contents in which gynecology fairly revels, the misconceptions resulting from restricted etiology are the source of unmeasured therapeutic misapplications, and their ill effects.

The neglect of etiology also tends to render a subordinate principle in therapeutics the controlling one, to the further disadvantage of the patient. The latter naturally blends in his mind the pain he suffers, with its causes; and associates the two, however distinct and distant, as a localized unit. Remedies are therefore called for to subdue disagreeable sensations, however incompatible this may be with the pathological requirements. The physician who neglects the *sources* of the local manifestations, whether at the hernial border or

in the pelvis, becomes almost unwittingly guided by the morbid feelings of his patient, and therefore restricts his therapeutic endeavors to the limits afforded by the one diagnostic indication, without reference to its etiological base. He is therefore liable to neglect the real sources of the difficulty, because he exalts a subordinate factor to undue proportions. The physician's etiological facts are easily limited to what is within his purview. His therapeutic resources suffer the same restriction. In pelvic pathology, the etiology becomes practically restricted to the revelations of the speculum, the sound, the touch, aided by the patient's subjective symptoms of discomfort and disability. The patient has little or no power to trace the tangible and sensorial indications back through the proper channels, to the causative physiological defects from which they arise; and it is with almost equal difficulty that the gynecological specialist relaxes his hold on his coveted local discovery, to ruminate on the course of physiological aberration that was necessary for its production, and through which alone that portion of the affection which he has found, became possible.

A moment's reflection will show the insufficiency of the data derived from the local appearance of the contents of the pelvis, or even of hernia, for the purpose of determining their origin and cause. Physical examinations reveal products, not processes. They are the means of learning what has been done and is doing; and only by inference and ratiocination do they reveal the actual defects by which the morbid products occur and are maintained. The objective phenomena are plainly the accumulated product of precedent imperfect physiological activities at some undetermined point or stage of the physiological processes. The actual source from which the local manifestation is derived can be fully determined, not by one or another class of considerations, but from a practical familiarity with the leading processes of physiology, and their relative values as relates to the special subject of inquiry.

It therefore appears that whenever diagnostic inquiry fails to include these intangible and invisible elements and factors, the etiological view is incomplete, the conclusions defective, and, to a certain extent, erroneous. As a consequence, the therapeutic inference becomes seriously vitiated. The remedy prescribed under these conditions is not applied to actual current defects, which consist of processes causing tangible and visible phenomena, but only to the record of past defective and erroneous physiological processes. The abolition of these consequences and effects, even granting the possibility while the causes are in full operation, can have no necessary therapeutic connection with the causes themselves. The remedy in this case is addressed to the pathological outcome and not to the physiological imperfection from which such outcome arises, and through which only it is possible. It is therefore to a certain extent misdirected, and can have but little influence on the course of the actual disease. This exists potentially in its sources, rather than in consequences.

The relations of etiology to the therapeutics of the hernial and the pelvic regions may perhaps be better enforced by considering the organism as a unit or whole. The vitality and the functional power of the separate parts will then be seen to be dependent on the vital mechanism pervading the whole organism, from which each separate portion derives its nutritive, and therefore its functional existence. There is mutual co-operation and interdependence throughout. The local parts are by no means independent, therapeutically, as local therapeutics seems to imply, because they are not, physiologically. In the nature of things, there is no intermediate or alternative principle as a basis for therapeutics.

This mutual interdependent relation may be illustrated by an example having immediate connection with our subject. The functional power and the health of the brain, for in-

stance, depends on its nutrition; that is, upon the supply of material which parts with energy that becomes specialized by the vital mechanism of the substance of the organ; and this includes the prompt removal of the de-energized material.

In this process, the brain substance, under functional activity, has the power to attract an abundant supply of the required material into its substance through the circulation of the blood. In this it resembles every other localized organ; but the brain substance has not the least further control over the material it thus employs. In the sense of maintaining local nutritive support, it is as powerless as a steam engine with its exit port entirely closed. No action or power can be derived from a machine in this condition, under any pressure of steam.

Now the blood, with its residuals and acquired products of waste, is withdrawn from the brain by appropriate mechanism quite outside of itself. The health and power of the organs are therefore intimately associated with this eliminative mechanism. An inferior degree of its working, causes a corresponding inferior degree of elimination, which is equivalent to retention of foreign and injurious matters, and a depression of vital power and all the consequences of lowered vitality, material and functional, immediately follow. The brain is therefore at the mercy, so to speak, of the integrity of the mechanism whose functional duty it is to maintain constant renewal of material in the brain-tissues, through its supply and removal.

The pelvis, including the hernial region, has mechanical relations entirely analogous to the head. The pelvic walls, like the skull bones, have immense resisting power adapted to the perfect protection of its precious contents against outside encroachments. Like the brain, the pelvic contents have very little control of their blood; this fluid passes in, in response to functional calls; it passes out by means of exterior mechanism, over which the interior function and

interior mechanism have very little control. In spite of the varieties of functional activity involved in either locality, the parts included by the bony enclosures of the brain and pelvic contents have little or no power to urge forward in its course the immense blood-supplies required at all times for local functional duty. These important local regions of the body, whose processes need to have a degree of perfection, certainly not inferior to any other, are evidently dependent on outside aid for the renewal of nutritive supplies, exhausted of the energies they impart. This fact argues the adequacy of the mechanism adapted to that purpose, located outside the regions in which it is operative.

Assuming the general correctness of the above statements from the mechanical point of view, it follows that local pelvic hyperæmia must supervene whenever the mechanism which antagonizes that condition works ineffectually and imperfectly. From the condition of local blood-stasis flows unnumbered varieties and possibilities of local, functional and organic disease. The removal of these consequences of local pelvic blood-stasis, naturally begins with the removal of their cause—the restoration to full and effective activity of the defective mechanism by which it is ordinarily secured. Its transient removal by any other means, however flattering its immediate effect, cannot be of the least permanent service, because neither automatic or continued.

It is thus seen how the local nutrition and the local circulation, which so seriously engage the concern of the gynecologist, are perfected in quite another way from that in which his efforts are made, and by methods which will be shown to be principally at the command of even weakly invalids. Defects of the circulation, or more properly of the mechanism which controls the return or venous circulation from the pelvic region (which also includes the lower border of the abdomen), is *one* of the two principal difficulties with which the gynecologist has to contend.

The *other* difficulty of equal seriousness, and the results of whose gynecological treatment usually proves equally unsatisfactory, are faults of position. The pelvic contents, or some portion thereof, become crowded out of place, depressed, inclined, flexed and otherwise forced out of natural position. This form of fault may be characterized as one of *sustentation*, since it will be shown that the mechanism which affords support to the contents of the pelvis is located *above* these contents, and does not inhere in them.

It is this form of defect that allows portions of the digestive organs and omentum to press heavily against the lower rim of the abdominal wall, and even to force their way through, constituting hernia. In other words, hernia and difficulties of position of the pelvic contents arise from precisely the same cause. They are therefore remedied on precisely the same principles; and the application of this principle consists in restoring the efficacy of the physiological mechanism, whose defect is equivalent to defective sustentation.

To recapitulate the etiological principles relating to affections of the pelvic contents and the lower portion of the digestive organs:

The circulation of the blood and the maintenance of normal nutritive acts is far from being controlled by the local organs, but is dependent on causes affecting the motions of the blood, or physiological mechanism, outside of, and distant from, the parts liable to suffer from its defective action.

The sustentation of the mobile contents of the pelvis in opposition to gravitation, and the pressure of the overlying organs and other forces liable to encroach upon them, sustentation which extends to the adjacent loups of digestive organs, is not effected by any sustaining or resisting power inherent in the parts themselves, but depends on physiological mechanism separately provided for this very purpose. This mechanism is perfectly effective and trustworthy in health. To restore its full and due power is to achieve the

highest therapeutic accomplishment possible in relation to these organs. To define the nature, extent, capacity and availability of this physiological mechanism is the purpose of the following chapters.

III.

The Forces Tending to Produce, and those Tending to Oppose Hernia.—The Truss.

Hernia, or protrusion of a segment of the digestive tube or omentum, is a result of disproportion between causes urging the mobile mass of digestive organs and their appendages, downward, and those opposing or restraining the downward movement. When the latter forces are ineffective, the confining walls yield, partly by division of fibres entering into the composition of the yielding part, and partly by the distention of other fibres, weak and elastic in their nature.

The usual forms of hernia occur at the base of the anterior wall of the abdomen, at or near its junction with the pelvic bones, which for distinction may be called the *hernial region.* The abdominal wall is composed of several distinct anatomical structures, each offering different degrees of resistance, and it is those differences that influence the direction which the protrusion chances to take. It will be necessary to note only the following:

Interiorly the lining membrane is common to the whole cavity of the abdomen, the peritoneum. This is very elastic and is readily stretched out by interior pressure, between the fibres of more resisting tissues, as a loose piece of fabric yields to the thrust of one's finger. In passing outward, the tumor, consisting of its peritoneal covering and contents, next meets with resisting and inelastic tissue, which by a sort of wedge-like action, it cleaves asunder. This may be a membranous septum, as in femoral hernia, or the combined tendons of muscles, as in the inguinal variety. The remaining tissues being elas-

tic, are mostly carried before the advancing protrusion, distended and thinned out. The inner, narrower and restricted portion of the canal thus caused forms a neck, which is the part of chief interest to the surgeon, for it is here only that the event called strangulation can occur.

For, should the compression of this narrowest part of the neck be so great as to obstruct the passage of the blood in the vessels of the protruded part, or the contents of the digestive canal, or both, the most serious, perhaps fatal, consequences may follow. Morbid processes are inaugurated on the suspension of the normal processes; these soon assume a destructive form, which threaten, and finally subvert, the vitality of the whole system. Hence the necessity of immediate relief by some means; and therefore the great importance to the individual of such knowledge of his powers, and of the resources of the system as shall enable him to secure it, promptly and certainly.

The reader should be guarded against the conclusion that the relief of strangulation is a cure for the hernia. It is only the removal of what may be a dangerous crisis, and has nothing whatever to do with the causes of the affection, wherever these may be conceived to be located. After the constriction is liberated by whatever means, and the protrusion returned to the cavity of the abdomen from which it escaped, its causes continue to exist as potentially as before, whether these be weakness at the abdominal wall, which is much increased by the operation for enlarging the opening, or compression of the overlying parts, which is not in the least changed. So far as the affection resides in its causes, it is entirely unaffected by the surgical operation; the same need of cure remains.

It will be seen that the question as to what is the potential factor of hernia is called up at every suggestion respecting the affection, and that intimations of two sources have been presented. One is weakness of the abdominal wall in the hernial region; the other is weight, or gravitation of the

contents of the abdominal cavity, and whatever forces may co-operate with gravitation in urging downward the mobile contents of the cavity of the abdomen. The radical cure of this and of allied affections depends on correct ideas. If these manifestations be regarded as the effect of superincumbent dead weight of the contents of the abdomen, then relief will be sought in mitigating the weight. If these affections be attributed to mechanical weakness of the containing walls in contact with the part urging its downward way, the palliative resource is that of mechanically supplementing such weakness, by additional mechanical obstruction. If both these causes be conceived to be joint factors, the remedy suggested is such as naturally opposes the conjoined causes. The indifferent success of the usual modes of meeting these indications is well known.

The popular idea of hernia, to which the medical world appears to oppose no active protest, is that its existence is a purely mechanical incident; that it is just what is represented to the eye and the touch, and, therapeutically, nothing more. The infraction of the retaining wall of the abdomen is a mechanical circumstance; the insinuating descending wedge of viscera represents mechanical force; the cleavage before it of tissues permitting extrusion is a mechanical effect; the constricting band encircling the neck foreshadowing danger, is mechanical; and the inferences touching the remedy lead to mechanical conclusions only, as the ultimate consummation of the whole matter. As the subject is almost universally regarded, none but mechanical factors appear to enter into its consideration.

Under these restricted and inadequate views nothing can be more natural than that the remedy should have corresponding restriction and inadequacy. Hence whatever be the form, degree, complication, or incidental needs arising from the affection, these are responded to by mechanical provisions; no other are really insisted on, or in general appear

to be thought of. The usual recourse consists in opposing the protrusion by a mechanical obstacle, as fluids are restrained from escaping from the vessels they may occupy. No credit is given to the existence, or the possibility of any physiological provision for a retaining or restraining power, which manifestly *must* exist in the whole world of the unherniated, and should at least oppose the affection, even if not remedial. Nor in the therapeutics of the affection (if the measures resorted to may be called by that name) is any reference usually made to its etiology.

THE TRUSS.

The mechanical remedy to which reference has been made is embodied in the instrument called the *truss*—the remedy sanctioned by ages of universal usage. The best surgical writers labor to show the probable *danger* to life of omitting the use of the truss, not only in case of fully developed hernia, but also whenever there is the least indication or even suspicion that protrusion may occur. They also insist on its continued use even after its needlessness appears to be demonstrated. The neglect of physiological facts which such advice implies, has entailed needless fear and untold suffering on large numbers of men. The caution expressed by surgeons is taken up and resounded abroad by instrument makers, venders, and others interested in trade; serving still further to distract attention from the facts involved in the etiology of the affection, till it is found that incredible numbers of men are at this time wearing trusses. The proportion assigned by cautious and trustworthy surgeons, as stated to the author, is about one person in eight. If we are to believe the statements of specialists, who have commercial basis for data in the sales they effect of the instrument, the proportion is much larger, one vender declaring that seventy-five per cent. of the community wear trusses.

What appears most singular in the light of the principles of mechanico-physiology to be explained, is the fact that the efforts of the most ingenious, ambitious, and boldest specialists in the particular department now referred to, appear to restrict their inventive talent to modifications of the instrument; but give little or no attention to the grounds for its need, or to the discovery of other methods for coping adequately with the affection than mere mechanical opposition.

Nothing can exceed the simplicity of the purpose of the truss, and the mechanical adaptation of the means to the ends proposed. As before stated, the truss opposes the protruding mass constituting the hernia, by a mechanical obstacle—a pad held firmly against the hernial aperture. The opposition is limited to the point of the appearance of the affection; nothing more is demanded by the theory of its use. Various dealers, but it is charitably believed only in the interests of trade, not unfrequently insist on an additional effect of the use of their particular make, in causing such agglutination of the tissues by continued local compression, as will allow the instrument to be finally disused. As this proposition has received some degree of credence, it will be further separately considered.

The truss is composed of a girdle encircling the lower part of the body, whose purpose is to keep in place the only effective part of the instrument—the pad. The pad is adapted to cover the protrusion, to press upon it, and keep it back, at least as far as the pressure it affords extends, and to imitate the resistance to descent normally supplied by nature. The pad is a sort of patch of the abdominal rent, or plug for the hernial opening. The pad is provided with a light spring, so as to maintain self-adjustment as far as this is possible in the various changes of bodily position necessitated by the avocations in which the person may be engaged.

It should be mentioned that the "war of the trusses"

industriously maintained by circulars and newspaper advertisements, do not, as might easily be inferred by their readers, relate to radical or even to novel principles, but to mechanical details and devices, whereby the pad is adjusted to the hernial opening.

It is a generally accepted principle that the truss once applied and suited to the form of the body and the local protrusion, is to be worn indefinitely. Some of those engaged in the supply of the article advise its being discarded on retiring; others as vehemently insist on its constant use, night and day. In any case, its use does not contemplate its discontinuance, except perhaps under the remote promise of ultimate radical cure by its means, which is occasionally held out, the value of which will be subsequently examined.

The truss belongs to a class of remedies, quite too numerous, which may be styled perennial and self-perpetuating; once in use, always in use. It superinduces the need for its indefinite continuation. The hope of arriving at a stage of improvement to allow of its discontinuance, is rudely dashed by every attempt to do so, and the victim tries to reconcile himself to his unwilling, but apparently inevitable fate, till a lucky chance or better knowledge relieves him of his dilemma.

The curative effects reported of the use of the truss would be more accurate if stated to be in spite, instead of in consequence, of its use. The precedent use of the instrument is inconclusive evidence of even occasional benefit; because the physiological defects, for the consequences of which the truss is employed, are subject to self-rectification, and under sufficiently improved conditions are, as will be shown, certain of such results. When the supposed need of the truss is surmounted, whether by direct design or by accidental conformity with the necessary conditions, the instrument may be laid aside. But such consequences are possible only through re-

moval of the causes which culminated in the protrusion, and not by any means from the use of the truss.

The sentiments of the medical profession, in respect to the indispensableness of the truss, and also as to its effect being limited to that of mere palliation are fairly echoed by Dr. W. F. Clark in his surgical work. He says, "Life is in jeopardy so long as the ruptured man is going about without a properly fitted truss." "In adults a cure by truss cannot be expected."

GROUNDS FOR THE CONCLUSION THAT THE MECHANICAL METHOD IS INADEQUATE.

It hence appears conclusive that mechanical obstruction is really no remedy for hernial protrusion. In spite of its most faithful application under the most favorable conditions, the loop of intestine continues to descend as far as the pad will allow, the infraction of the hernial tissues remains, and the causes upon which these facts depend are not in the least degree rectified. The truss is at best but a palliation that might advantageously be dispensed with under more intelligent conceptions of the fault to be remedied. Its function is merely that of the crutch, or the artificial limb, which do not restore the organs of locomotion, but only palliate the inconveniences of their defects.

It is the nature of remedies to repair defects, to restore parts and functions to their pristine condition; or at least, approximately so, abating only the consequences of deteriorated vitality on which all repair of the living, growing, changing organism ultimately depends. Neither the wearer nor the prescriber of the truss can reasonably expect any such consequence to flow from its use. It only palliates what its use concedes to be an organic infirmity.

Other considerations point to the inadequacy, as well as the inappropriateness of the common way of palliating hernia.

This method implies that nature is less beneficent in the accident under consideration than in most others. For when a limb is fractured or a joint dislocated, the surgical treatment contemplates radical cure, the restoration of the integrity and usefulness of the limb, however grave and complicated the injury may be. Such treatment does not from the outset concede the permanency of the effect produced by the injury, and the legacy of a limp and useless appendage, a hindrance, rather than a help, through the remaining course of life. The treatment, whatever its success, is radical and looks to radical ends; and it is not expected to be limitless. Not so the treatment by the truss of hernia. Its processes begin and end with pushing back, and, if possible, keeping back, *concealing*, in fact, the hernial protrusion; not in preventing the descent of the hernial loop to compress the hernial tissues; nor in assisting the restoration of the natural resistance which is clearly effective in every example of health the world over.

A consideration of the nature of the defect or defects of which hernia is evidence, is conclusive as to the nature of the remedy demanded by science and philosophy, and shows the utter absurdity of the exterior mechanical makeshifts, to which recourse is usually made. It is patent that the accident does not arise from the want of what is supplied as remedy. It arises either from inadequacy of the hernial tissues; or excess of gravitation and of other forces brought to bear upon these tissues; or from persistency of the wedge-like hernial mass, whether intestinal, omental, or both, against otherwise resisting structures; or from all of these together. Rational considerations would naturally lead to seeking some way of rectifying these causes, separate and combined. It is plain that in all cases of absence of hernia, that is, of health, these causes do not exist. It follows that their existence is the product of vital deterioration, which calls, remedially, *not* for exterior mechanism, but for means of correction of the

causes; in short, for the physician and not for the mechanician. It is hardly less than a reproach to medical science and medical practice that physicians should so long allow themselves quietly to be supplanted by the mechanic, the empiric and the quack, in the treatment of one of the most widespread, serious and lasting affections to which individuals of civilized communities are liable, apparently from deficient appreciation by themselves of its real nature and relations.

INJURIOUS EFFECTS OF THE HERNIAL TRUSS.

The exclusively mechanical treatment of hernia is, as we have seen, quite incapable of raising the presenting part of the intestine from the hernial region of the abdominal wall; or even to sustain, in any sufficient degree, the downward pressure of the hernial contents; and besides, has not the least adaptation to remove, abate, or in any way to control the contributory causes, without which the existence of the affection is impossible.

Neither can the truss afford the least assistance in removing the serious phase of the affection, strangulation. Its use comes in only after relief is found by operating to remove the stricture.

But the objections to the truss are by no means confined to those of a negative character. It inflicts positive injury, and diminishes the curability of these cases by the positive methods to be described.

1. The belt or girdle required to secure adjustment of the pad, confines and represses the action of the muscles over which it extends; it therefore diminishes their substance and power.

The effect of the repression extends to the connections of these muscles throughout the hernial region, including the borders of the canal and the coverings of the sac. In health, these tissues, including the peritonæum, tendons, ligaments,

fascia, connective tissue, etc., are, as occasion demands, subjected to use, constantly testing their powers, hardening their substance, increasing their resisting qualities, and inviting their nutritive support; effects which are, to an injurious degree, prevented by the mechanical restraint imposed by the instrument.

2. A consequence of repression of muscular power of the abdominal muscles by the encircling girdle and pad, is the gradual and certain diminution in the degree to which these muscles participate in the ordinary motions of respiration. In health these motions extend to the lowest part of the abdomen, but become gradually diminished till the lower portion of these muscles scarcely participate at all in their appointed rhythmic motions. One of the most essential functions of the body—that of respiration—is therefore impaired, the powers of digestion inevitably suffer from want of their natural motor stimulus, constipation is superinduced, with all the train of evils which necessarily accompany this symptom.

3. The hernial pad does not, as the patient is frequently led to think, really *close* the hernial opening; it only *covers* it —keeps it out of sight. The degree of perfection with which this is done is measured by the accuracy with which it adjusts itself to the contiguous tissues.

Here is another fallacious consequence of regarding hernia from an exclusively mechanical point of view. To compress vital structures, whatever their nature and wherever situated, is to repress their development and diminish their substance. Pressure causes absorption, and is even employed with success to eradicate morbid growths. It excludes the blood necessary for nutritive support, and breaks down organic structures. Pressure of a pad therefore weakens the tissues bordering the hernial opening, and increases its size. This effect becomes conspicuous when a conical pad is used, which, acting like a wedge, drives further apart the bordering tissues.

No possible modification of shape of the pad, whose purpose and effect is pressure, can remove this objection.

In practice, the local deterioration of tissue naturally attending the use of the truss may be diminished, and perhaps in some degree counteracted by the frequent alternations of pressure, necessitated by changes of bodily position and by the working of the muscles of the general system. Its injurious effects are only modified by the interruptions of pressure.

4. Granting the imminence of strangulation, it by no means follows that the truss is a reliable preventive, or even that the amount of fatality from this cause is diminished by its use. That strangulation with fatal results occurs to individuals who have long worn trusses, is well known to physicians. Constant apposition of the pad, however ingeniously constructed the truss may be, is nearly impossible. And since the wearing of the instrument increases the weakness of the hernial tissues, it actually diminishes the natural supports; it enlarges the size of the hernial opening, and increases the persistency of impingement of the intestine against the hernial opening. The probability of its escape beyond the control of the pad designed to obstruct it, cannot, on the whole, be specially diminished, and may be greatly increased, by its use. The affection remains a constant threat as well as annoyance; and the instrument, so far from being a blessing is but a sorry substitute for those positive remedial measures which render the truss supererogatory.

5. Not the least of the injuries flowing from the mechanical idea embodied in the hernial pad is the false direction thus afforded to medical inquiry. The attention both of patient and medical adviser becomes so preoccupied by the exterior appearances, that the controlling facts appear to be excluded. The immediate, visible and palpable, usurp the place of the essential and controlling, and stifle further inquiry. In this case the potential affection, though close behind its outward

manifestation, is quietly ignored. The remedy to which recourse is usually had is but a practical evasion of the real pathology of the case; its purpose is other than remedial; for remedies, to be effectual, must have some relation to the causes which maintain the morbid condition. Actual remedies do not imply perpetual repetition. The truss only recognizes the secondary and consequential factors of hernia, while the primary and originating factors are neglected and therefore remain in full force.

INCORRECT VIEWS FOSTERED BY THE USE OF THE TRUSS.

The mechanical remedy for hernia is based upon and is the natural outcome of a connected series of misconceptions which do violence to the facts and principles of physiology. Some of these will be briefly enumerated as an introduction to the development of the principles and methods for the radical cure of this much wronged affection.

1. The assumption that the anterior abdominal wall and especially its hernial region is a mere mechanical object to be treated as the faulty walls of an inanimate vessel, is clearly erroneous, and the remedial methods based on this must be faulty.

On the contrary, every minute constituent of the wall of the abdomen, including of course the hernial region, is vital; and as such is in health the subject of incessant molecular change. Its whole substance and function depend on and are the products of these changes. It is this important fact that renders it subject to deterioration, therefore to the contrary, or development of power. Hernia, it must be conceded, is inseparably connected with the first, and therefore, and by logical necessity, its cure is as inseparably connected with and dependent on the last.

Vital power, wherever manifested, always subsists through contributory conditions. Its rise and its depression are sim-

ply expressions of the ratio of these conditions. Any defect in the wall at the hernial region, if such a fact appears, is positive indication of corresponding defect in the circumstances which contribute to and result in power, both acting and resisting, in these walls. The plain therapeutic inference is, that the remedial need is not concealment, but development of local power and local capacity for resistance. If it were the strength of a limb that was called in question, such at least would be the simple conclusion of the least experienced.

2. The assumption, at least implied by the mechanical treatment, that the whole gravitating force of the contents of the abdomen in health naturally impinges upon the hernial region, is untrue of animals, and equally so of the human species.

The weight of the mass contained by the cavity of the trunk in health is largely sustained by the arching dome of the chest, including the co-operative assistance of the diaphragm. The relations of the contents of the abdomen may not inaptly be compared to that of a plate of false teeth, upheld by its physical connection with the overlying parts.

3. The assumption certainly implied by ordinary procedures for hernia, that anatomy rules while physiology is inert, is easily seen to be erroneous. The contents of the abdomen in health are as far as possible from being an inert mass subject to the unopposed laws of gravitation. On the contrary, the whole mass yields constant obedience to rhythmic reciprocating motions of great power; and these are uninterrupted from the dawn to the end of life. This motion is ostensibly respiratory, but is of no less importance to several other constant necessities of our being.

This rhythmic motion includes in health the whole mass of the contents of the trunk, and subjects the intestinal and omental mass to a constant succession of *lifts* by its upward-forcing action. This physiological fact proves the impossibility of the assumption that in health the hernial tissues

sustain the weight of the abdominal mass. Whether, indeed, they sustain any weight, depends on the action and effect of this physiological sustaining cause. The amount of power capable of emanating from this mechanico-physiological source in compliance with sudden requirements, remains to be shown.

4. The assumption that muscular strain, as in general exercise, is in health precipitated upon the hernial region, is contrary to ordinary experience and to fact. All effort involves as a pre-requisite, an increase of the rhythmic motion; this produces increased sustentation and actual diminution —often complete removal of the weight of the abdominal contents from the hernial region. Hernia does not occur in the class of subjects subject to habitual equable use of the muscular system; by such exercise the combined tissues of the hernial region acquire resisting power far beyond the reach of any accident whatever.

5. The assumption implied by the pad that in health there may be an insinuating loop of intestine or omentum lurking behind the weak hernial spot, ready on slight provocation to work its way into or through the hernial canal is contradicted by physiological facts.

The function of rhythmic mobility above referred to involves a constant gliding motion, not only of the folds of intestines upon each other, but also upon the abdominal parietes, which is entirely incompatible with persistent pressure at any point however weak. Such pressure can only occur in consequence of the discontinuance of the natural rhythmic motions at this part of the abdomen, and the cessation of the gliding of the intestinal and omental folds upon each other and upon the abdominal peritoneum.

6. It is thus shown that hernia exists, not as an outward entity merely, but as the culmination of a series of physiological defects. These are by no means confined to the spot to which the hernial pad is applied, or which may be sub-

jected to operations designed to afford an obstacle equivalent thereto; but exist potentially, not only in defects of the local tissues, but far more in defects of physiological activities, which include both the minutest and most massive functions of the organism on which the local tissues depend. It is further seen why it is impossible to supply an actual remedy for the affliction, whatever may be said to the contrary, while the causes are neglected; all local remedies inevitably result in failures, and many are foisted upon the unwary sufferer by bald deception.

To question the conclusions sanctioned by the traditions of the medical world may appear impertinent, to a degree scarcely less than profanation. The writer only pleads the authority of truth, against the truth of authority; the unimpeachableness of the principles and the facts he presents. Not only has he verified these amply in practice, in cases of the most extreme and trying character, but he invites others to do the same. To facilitate such tests he places the methods affording such tests in detail alike before the medical profession and the public, so that any one of moderate capacity may verify, disprove or improve these methods and principles, as may be their destiny.

The radical cure of hernia is but a subordinate department of the application of the facts and principles of mechanico-physiology. A similar class of affections, having their manifestation in the pelvic contents instead of the hernial border, and having a similar etiological source, are even more extant among women; and are usually treated by modifications of the truss, often of interior adaptation, with as little, even less curative effect. The application of these principles is of even greater significance and value to this often helpless and hopeless class. It easily enables the sufferer, perhaps of years, to dispense with the so-called support, which she soon finds had been but a deceit and a snare.

IV.

Physiological Mechanism Related to Hernia and the Pelvis.

All forms and degrees of hernia are wholly dependent on clearly defined and perfect intelligible causes. The affection exists potentially in certain faulty physiological factors. These, therefore, are the legitimate objects of remedial attention. To bestow supreme care on the extruded viscera serves, as we have seen, to defeat the cure, because it withdraws attention from those primary and essential conditions whereby the affection becomes possible ; whose continuance maintains the protrusion, and whose correction, of necessity, removes it. The supply of exterior mechanical opposition prevents the remedial treatment legitimately due, and perpetuates the hernia indefinitely.

The visceral gravitation on the one hand, and the insufficiency of the hernial tissues on the other, are entirely amenable to the control of the physiological mechanism, whenever this is correctly understood. The vito-mechanism is, therefore, the *neglected factor ;* the absence of its consideration vitiates the ordinary apprehension of the affection, and renders the adoption of the usual or concealment method necessary. The vito-mechanical is the only factor capable of completely controlling the causes of the affection, and of affording radical, unequivocal, and permanent relief.

The physiological factor is, indeed, identical with the mechanism of the vital system in health. It includes all contributions and accessories to the maintenance of the working mechanism of the living organism. It not only includes the tissues subject to infraction or rupture, but also the connections, sources and dependencies of these tissues. It not only regards the weight of the abdominal contents, but the causes of its excess at the hernial region, and the reason for the morbid

consequences. In short, the introduction of the physiological factor relegates the affection from the category of dead to that of living matter, and entirely changes the base of therapeutic indications. It is no longer an independent, self-produced and self-subsistent entity, but a special issue of defective physiology. This recognition leads to the discovery of the actual faults, and dictates the method for removing these, which replace those misdirected endeavors which are constantly over-demonstrated as fruitless.

These statements regarding the supremacy of the physiological factor of hernia may be conceded in a general way, for health is only the product of unembarrassed physiological action, which, of course, excludes hernia. But after the accident has happened, and there is actual protrusion, their applicability may not be so clear. There are then the added complications of a ruptured wall, and the displacement by extrusion of a portion of the contents of the abdominal cavity. These incidents do not, however, in any wise exclude physiological principles. They do not even call for the introduction of any new principles of procedure. These complications only emphasize the damaging effect of precedent physiological neglect, and the pressing necessity for the restoration of physiological integrity, by the correction of its faults, which have now assumed unequivocal and tangible shape. The remedy is still included within the resources of physiology; resources which only require to be specialized to become addressed to the local and extreme requirements, not only of the faulty causes, but their consequences as indicated in their fully developed effect in the form of hernia. The curative results are complete, permanent, and satisfactory, in proportion as the causes are practically understood and corrected.

MECHANICO-PHYSIOLOGY OF SUSTENTATION.

To comprehend adequately the therapeutic effects of the application of principles included within the resources of physiology, that is, physiological mechanics, it will be necessary to call to mind in considerable detail the mechanical properties of the organism, as represented in its anatomical frame and constitution, and in its dynamic powers as shown in its acting, moving parts or segments, when these are in their natural and healthy relations. We may then, and only then, determine the actual location and the special nature of the defects of which hernia is the outgrowth and culmination. We may then also understand the reason for the fact demonstrable in practice, that physiological rectification at defective points is abundantly capable of removing not only the weakness, but the mechanical consequences arising therefrom, and we shall understand more clearly than is otherwise possible, that hernia is but an instance of the self-evident principle that effects are impossible, as well as inconceivable, in the absence of the causes on which they depend.

The first object of inquiry is the physical structure and mechanism of the trunk. For the present purpose the trunk may be regarded as an irregular ovoid enclosure, whose different parts have the following special relations to its contents.

The inferior boundary of the trunk is rendered perfectly solid and rigid by containing the largest, heaviest bones of the whole anatomical frame, the pelvic bones. The great firmness of these bones affords a practically inelastic, inextensible base. Rising from the pelvis is the spinal column, which serves as the posterior boundary of the cavity of the trunk, and, as relates to the cavity, is also practically inextensible. Surmounting the spine is the great dome formed by the ribs joined in front to the breast bone. The ribs are so united to the vertebræ and to the breast bone as to offer con-

siderable resistance with elasticity, as opposed to any force, physiological, or otherwise, which may be brought to bear upon them. This compound mechanical structure, which, uniting resisting with extensible qualities, will be shown to be a most important mechanical provision in its relation to hernia and its radical cure. Below the ribs is the abdominal wall, composed largely of muscular substance, so disposed as to allow of contraction as a whole; or the separate contraction of a specified, pre-determined portion; or contraction in any particular direction, as occasion may dictate. This multiple capacity of the abdominal wall serves, as will be shown, most important therapeutic purposes.

This wall is also an exceedingly extensible and elastic diaphragm, not only instantly conforming to the varying bulk of the contents of the cavity, but also capable by the power of its muscles in connection with those of the chest, of forcibly increasing and diminishing the contained space, and therefore the position of the bulk of the contents; the external atmosphere being the substance which yields to accommodate these changes.

The muscles of the abdomen act in response to nervous incitations from two distinct sources. They act in response to the will the same as the limbs; and, without the will, through nervous connection with the organic mechanism, whether one is asleep or awake. The ordinary and healthful actions of the muscles of the abdomen are in fact coincident with, and a part of, the respiratory act. As all the remaining portion of the wall of the trunk offers more or less rigidity to mechanical influences, however brought to bear upon it, and as this portion has a great degree of mechanical suppleness, it is clearly the mechanical intention of nature that the changes of amount of space of the interior cavity should be directly related to this property of the abdominal wall; and that this wall should ordinarily participate in the respiratory act in larger degree than any other

portion of the enclosure of the cavity included in the trunk-walls.

We may doubtless be justified in forming a judgment of the uses of an object from its structural adaptations; and this is a reigning principle in physiology as in mechanics. Were an inanimate mechanism presented for examination, whose general description was found to agree with that above given of the mechanical construction of the trunk walls, there would be no difficulty in deciding as to its design and purpose. Indeed illustrative examples of mechanism are among the most common objects around us. No one would need to be told that such a mechanical arrangement is adapted to speedy and complete adjustment to variable bulk of contents; that the contained space might, with equal facility, accommodate more or less of what it is intended to hold, through a wide range of extensibility, according to the demand that might be made upon such space.

Even the uninstructed are able at sight to acquire a tolerably correct idea as to how these changes of capacity, rhythmic and voluntary, occur. The mobile and elastic portions, which form the anterior wall of the abdomen, are charged with the function of increasing and diminishing the space they enclose. This is effected by the alternate expansion and contraction of the abdominal portion of the enclosure. The action is rhythmic, and corresponds exactly with the needs of the general system under the circumstances of the moment. The elastic and contractile portions of the trunk walls perform the work, while the rigid portions direct and guide the effect.

Several familiar mechanical contrivances illustrate very well the mechanical process here brought to notice. The bellows and its modifications, and the syringe, whether elastic or with a piston, are good examples, if we consider the movable parts of these machines as the source of the power and motion, while the rigid portions direct the effects of the force

disengaged. In either case, power supplied to one portion of the instrument, urges the contents of the reservoir toward and from its outlet, situated at an extreme remote part of the instrument. The whole of the contained mass, whatever its consistence, is subjected to oscillating motions, with the effect of changing the amount of space, and therefore of the contents at that end which communicates freely with the exterior.

The animal body is a similar mechanism. When in a quiescent state it is practically rigid, except the anterior wall of the abdomen. The motions of respiration are then effected chiefly by the spontaneous contractions and dilations of this most elastic portion of the body. The return to the air of 30 cubic inches of that contained in one end of the enclosure is effected chiefly by the corresponding diminution of the cubic capacity, produced at the opposite end of the cavity, by the contraction of its walls; just as fluid is urged from the pipe of a syringe, by giving a forward motion to the piston which forms the boundary of the end of the reservoir opposite the outlet.

When we look at an animal quietly reposing, we witness much the same mechanical process. Respiration is a rhythmic motion, affording alternate variations of the cubic capacity of the space enclosed by the exterior walls, the dilation and contraction corresponding exactly to the volume of air respired. And while in repose, the action occurs in those portions which have the greatest mechanical facility and the least resistance. It is, therefore, effected by parts un encumbered by bone, cartilage, or resistance of any sort; by the contraction of the muscles of the extremely flexible and contractile abdominal walls.

The fact that the abdominal wall applies its powerful energy at the side of the movable contents of the body, and not immediately below the weight, is of no real consequence. The effect is just the same. The change of capacity afforded

by the contraction is the important consideration; the contents necessarily move in the direction of egress and in no other. Besides, this indirectness is more apparent than real. For when we consider the oblique position of the wings of the pelvic bones, and the relations of the inferior portion of the wall of the abdomen to these bones, we shall see that the adjustment gives an upward direction to any force exerted.

While the mechanical form of the process of respiration in the lower animals, accords with the description above detailed, the inference is necessary and conclusive that in the human kind the same form is also natural and essential to health. There is no exception to this form throughout the animal creation; nor, by inference could an exception be compatible with health. Even in the least organism known, the *amœba*, the whole minute cell or body undergoes changes of form, to effect *all* the purposes contemplated by nutrition, and not merely a portion of them.

The physiological needs of the digestive organs require the rhythmic waves coincident with respiration to extend through its mass. The mechanical construction above detailed also implies the necessity of this motion for the lower as well as the upper part of the cavity. Digestion and respiration are co-equal factors in providing the energies for which the organism is the instrument; their co-equal participation is essential; and the organic motor process, being under the same primary incentive, should equally affect both factors of nutrition, because any defect in either one is a defect of both.

For, whatever be the form of the energy evolved by the vital system, the contributions to such development from the two participating sources are in equal ratio; the organs therefore should be amenable to the same causes of physiological incitation. This is just what the mechanical rhythm, extending equally through the organs connected with respira-

tion and those connected with absorption of digested products, would supply, and what no other condition could.

The mechanical form of the digestive organs, absorption from which introduces nutritive support to the system at large, is adapted to the same end. The much convoluted tube, with many infoldings and much exterior surface, is adapted to the gliding motion of segments and parts upon each other which is necessarily produced by the extension of rhythmic motion through them. This gliding of parts is practically found essential to both their absorptive and circulatory functions.

The location and structure of the principal channels through which the products of digestion find their way into the circulation, afford conclusive evidence of the constant need, by the digestive organs, of rhythmic motion. These channels are the portal vein, which conveys its stream against gravity, to the liver; and the chyle duct, whose contents flow also in opposition to gravitation, to a still more elevated point of debouchement. The remarkable anatomical point that these vessels possess no valves, and appear to require none, is further evidence to the same effect. It is, therefore, an almost certain inference that the force which urges forward their contents must be largely derived from causes operating from without the walls of these important conduits of nutritive supplies. The rhythmic motions which clearly exist in all healthy animals, produce constant alternations of pressure upon the contents of these vessels, quite similar in kind and effect to that of the heart and arteries, which impel the arterial blood. The same mechanical purpose is doubtless effected in these more obscure conduits of fluid, by a perfectly analogous cause.

The long category of obstinate local diseases of the contents of the pelvis, connected with imperfect circulation of the blood, and especially with imperfect drainage from defect of the portal circulation, is evidence of the deficiency,

or the inadequate extension of the reciprocating rhythmic motions due to the inferior contents of the cavity of the trunk. The rapid disappearance of these diseases when this motion is restored, will be found to afford incontestable clinical evidence of the same fact.

THE INTERMEDIATE REGION OF RHYTHM.

The extreme flexibility and mobility of the anterior wall of the abdomen is peculiarly adapted to secure the amount of variation of air space in the lungs required for ordinary respiration in repose. When, however, repose is disturbed, and the volitions become expressed in action, the case becomes entirely changed by the new physiological considerations which enter into it. Under these circumstances, the parts immediately above those enclosing the short ribs, forming the upper part of the abdomen and the lower portion of the chest, are pressed into service and participate in the expansion, often to an extreme degree. This intermediary portion is quite capable of effecting the whole of the expansion and contraction necessary for full respiration. By intelligent and judicious management of conditions, this part of the trunk may be caused to expand to any desired degree, without specially increasing the respiratory effect, that is, the inhalation and discharge of air by the lungs.

In this case the mechanical change wrought in the abdominal walls is equivalent to that which is produced in the chest; the air space formed by the mechanical changes of shape of the body becomes exterior instead of interior.

The disposition of the muscles of the chest, anteriorly and posteriorly, is such as to favor the production of the greatest amount of effect at the intermediary region of the body, with the least expenditure of muscular power. When, therefore,

the need by the organism for air-change arises beyond the ordinary working power of the abdominal wall, it offers resistance, and by mechanical law, other parts offering equal resistance, participate in the rhythmic action.

The mechanico-physiological and the mechanical variability of which the rhythmic actions of the body are capable, and the consequences flowing from these, in repose; in full activity; under normal incentives, and under those devised by art for specific therapeutic purposes; with all the varying degrees and rates of expenditure of vital energy, cannot be too frequently or too strongly insisted on. It is the rhythmic motions attending respiration of healthy animals and men which maintains nutritive activity, and therefore muscular strength and resisting power in those parts of the organism by which this mechanical work is chiefly effected, namely, the abdominal walls; and especially in the mechanical connection of these with the pelvic bones, herein denominated the hernial region.

The normal increase of this rhythm, which is necessitated by any well directed work or voluntary expenditure of power, inevitably produces the following direct consequences; the air space produced in the intermediary region increases the extent of the vertical, surging motion of the whole mass contained in the cavity of the body, extending quite down to the hernial tissues, and the hernial portions of the abdominal contents. This vertical oscillatory motion lifts the whole mass toward the space in which the air change occurs. The extent of the lift corresponds to the increase of space formed by the widening and the upward motion of the base of the dome formed by the chest walls. The effect is not only wholly to antagonize gravitation, but to superinduce muscular action of extreme degree in the hernial tissues themselves, whereby their resisting power is developed and lifting power increased to their due extent.

The extent of the change of respiratory capacity of which

the trunk is susceptible, the greater portion of which inheres in the intermediary region, is surprising to those who have given no attention to the subject. The 15 to 30 cubic inches of air, changed at each ordinary respiratory act, is usually effected, as before stated, without perceptible movement of the intermediary region, but by the motion of the abdominal walls. The motion extends, however, to this region under moderate exertion, so as to cause a difference of an inch in circumference at the short ribs. Under these circumstances, the cubic inches of changed air increases to double or more than double that previously required. Suitable efforts directed to this end may increase the chest measure two, three and even more inches. Standard works of physiology cite authorities stating that under extreme effort the amount of air changed by the respiratory act may rise as high as 250 cubic inches.

The radical therapeutics of hernia is intimately connected with this intermediary trunk region, and the facility and certainty with which its capacity may be instantly changed from one extreme to the opposite. A moderate expansion of the lungs will introduce, say 100 cubic inches of air. This involves an increase of circumference of the body at the intermediary region of probably two or more inches. This action proves the capability of the chest and auxiliary muscles to expand the chest, by raising the anterior ends of the ribs; it proves the existence of the capacity for the cubic increase, and that the change is capable of being immediately produced.

The therapeutics of hernia involve two distinct considerations. One is the instantaneous requirement of drawing inward and upward the extruded part. This is fulfilled by putting in action the mechanical conditions, omitting the auto-physiological. It consists, in part at least, in sudden change of shape of the cavity of the body, in the absence of demand for air in the chest. The greatly expanded intermedi-

ary region becomes suddenly filled from below, and *not* from above; with the abdominal contents, and *not* with air. The diaphragm, the exterior abdominal wall, and the whole of the included mass, are therefore urged upward with a degree of force, if desirable, approaching violence, which no ordinary resistance at the seat of hernia can withstand.

The other requirement is the maintenance of sustentation, and the power which insures sustentation, by increasing the supremacy of that portion of the muscular system, anatomically and physiologically adapted to this purpose. This effect is primarily nutritive; it is secured by promoting the health of the parts by regular, wholesome use, always the indispensable condition for nutritive support of physiological power.

This end is attained through progressive development, and not suddenly. The feebleness of muscle, and the defective nervous power which permits hernia, may require that action or use of the defective mechanism be at first involuntary. This, however, so far from being a bar to success, is scarcely a difficulty. It only requires the incentive of nutritive activity to proceed from another, frequently an exterior source of supply, till such degree of nutritive effect in the muscles and nerves are secured as shall enable these organs to profitably engage in action on their own behalf.

The reader will understand that the force rendered available in the manner described is effective for raising all the depressed contents of the cavity of the trunk and pelvis alike, and is by no means confined to the digestive organs. The contents of the pelvis are subjected to the same upward force whatever be the process having that effect.

In recapitulation, the following principles respecting the mechanism of the trunk as relates to its inferior portion, should be borne in mind:

1. In repose, normal respiration engages only the most unresisting and elastic portions of the walls of the trunk; all

parts participating therein in inverse proportion to the resistance offered by the tissues and the gravitation of the contained mass. In this way the advantages conferred by mechanical motion become equally distributed to the respiratory and the digestive organs, in which these advantages are equally due; no other conditions are compatible with health.

In this way also the normal contractile and resisting qualities are maintained in the hernial tissues, which only can effectually oppose the existence of hernia; and in no other way can complete immunity be secured.

2. Whenever considerable expenditures of vital energy are demanded, by either muscles or nerves, or both, the rhythmic movements of respiration are proportionally increased. This increase rises to higher degrees by increased expenditure; developing, in central portions of the trunk, an intermediary capacity and power of surprising extent, available for therapeutic ends.

The mechanical effect of the operation of this power and action is that of antagonizing gravitation, even of *lifting* the whole of the digestive mass, and of subjecting it to vertical oscillation; a condition entirely the reverse of lying heavily upon inert hernial tissues. The abdominal contents are, with the aid contributed from the overarching dome of the chest, in a state of oscillatory suspension; a condition extending even through the contents of the pelvis. Ordinarily, the degree of suspension is in proportion to the engagement of the volitions in muscular acts, without reference to the direction these acts assume. In health, the hernial tissues are always secondarily influenced by every considerable voluntary action, because they contract and follow up the mass in its vertical oscillation; a co-operation essential to their integrity of function and substance.

3. The causes of hernia, and of the related affections of the pelvis, must be reached and corrected by any method of

cure that is worthy the name. These may now be properly estimated.

Hernial protrusion, and rectal and uterine prolapse, each alike indicate failure, not only on the part of the tissues, but also precedent failure of function of these tissues, which maintains their nutrition and strength. Vital function and vital substance are inseparably conjoined. These manifestations indicate insufficiency, often complete absence of participation of the lower portion of the abdomen, including wall and contents, in the respiratory rhythm. They also usually further indicate some perversion of the normal *style* of the rhythm. Some portions of the walls of the trunk engage in the act to an undue degree, as compensation for the defect of the act at the suffering region. This allows the tissues to fall into desuetude and deterioration. They therefore fail to offer resistance when emergencies demand it; these tissues are unable to maintain their integrity inviolable, against even weak mechanical assaults.

The principles of radical cure are therefore concentrated in the practical application of physiological principles, so elementary and easily understood that even the sufferer from hernia can easily and unmistakably adjust them to his own special need.

V.

Physiological Specialization a Remedial Principle.

While the provisions for the sustentation and the retention of the contents of the abdomen are undoubtedly sufficient in health, as is fully proved by their remaining in place; and while it may be conceded that hernia can result only from the failure of these physiological provisions, the question will still arise as to the adequate remedy when once the difficulty already exists. Given, a rupture of the abdominal wall through which a loop of viscera protrudes; strangulation

may be imminent or present, or strong adhesions may bind the loop of viscera to the hernial neck or adjoining peritonæum. Are the resources of mechanico-physiology adequate to remove the displaced and protruded portion of intestine, and secure the permanent restoration of the integrity of the parts concerned in the affection? The answer is, undoubtedly, yes; the mechanico-physiological resources are abundant, when intelligently directed, to secure these ends in the fullest degree. The undetermined question relates less to mechanism—this is the same in form at least as in health—than to vitality. How the condition of potential activity can be maintained; and how the local tissues which have suffered undoubted injury from the misdirected treatment to which they have probably been subjected in addition to the original disability, can regain their pristine power, is now the question of supreme interest. For, while the mechanical resources inherent and at easy command, may be superfluously abundant, it may be difficult to re-acquire the needed local vital power and integrity.

The desired remedial effects, in both their mechanical and vital aspects, are secured by *specialization.* And, before proceeding further, it is important to understand what is meant by the term as well as the processes of physiological specialization. It consists, in short, in concentrating at a pre-determined point the dynamic results of physiological activity. Specialization regards the organic system as being practically a reservoir of energy, capable of being directed, or urged in any special direction, in such a way that the functions, organs and tissues composing the favored region, are permanently benefited thereby.

The application of this principle to hernia is as simple and as practical as any in physiology. The protruding viscera are raised, as a hand is raised, by employing the mechanism provided and eminently adapted to that purpose. The hernial tissues, and all the contributory faults, are corrected, as

the structures composing the arm, weakened by prolonged disuse, or by inhibition of function from special causes, as local disease, are restored. The principle and its application to other parts of the organic system are, at least, no novelties. Still, as its practical application to hernia has been neglected, this point may be dwelt upon, if only for the purpose of familiarizing the reader with its special applications.

Whenever one stretches forth an arm, the incitation of the muscles by the will causes or develops within such muscles sufficient mechanical energy to overcome its inertia, the moderate resistance afforded by the weight of the member. The act, doubtless, superinduces in the muscle cells which engage therein, such nutritive changes, involving interchange of matter, as fully to compensate the expenditure of energy, and in addition, a degree of preparation for its repetition. This, however, is but a physiological incident; and expenditure is so moderate as not to impair or restrict expenditures in other directions. Other acts may therefore be free as ordinarily demanded, either simultaneously or immediately succeeding. Such opposing expenditures invite diffusive or equable distribution of nutritive support, and may be regarded as normal and wholesome.

If the hand seizes an object and raises it, the increased demand for expenditure is also readily supplied from the general resources of the system ; but its capacity for supplying the simultaneous demands of other organs also manifesting muscular power, is appreciably diminished. This will be seen should both hands, at the same time, attempt to raise equal weights. While the resources are not increased, the effects are weakened by division.

Should the object to be raised by manual exertion prove to be very ponderous, then all the energy the vital system is capable of yielding is called forth. The increased resistance demands and receives increased incitation proceeding from

the will, usually called effort, which travels over appropriate conduits to the muscles adapted to the end in view. The field of incitation is not limited to the muscles of the hand and arm, but extends to a series of other muscles and nerves which contribute their share to swell the stream of dynamic energy till it shall equal the resistance. These nervous and muscular powers converge at one point, and are tributary to a predetermined locality of expenditure. The vital organism is resolved into a reservoir of energy with a single outlet.

The facts to be noted in connection with specialization of physiological dynamics, for a distinct mechanical purpose, are these :

During the manifestation of the higher degrees of muscular energy, in any particular direction, with a view to the greatest mechanical effects, all physiological activities incompatible with this end fall into a state of suspense or inhibition. Such action robs the remainder of the system of its available power by the demand thus made upon its resources. The incitation and the inhibition have some measure of correspondence.

Also, during such manifestation of muscular energy, nutritive response occurs along the line which the specially engaged energy travels ; in the cerebral centres of the will ; in the nerve conductors ; in the substance of the muscles participating in the predetermined action. These nutritive changes inure to the special advantage of the tissues through which the flow of energy is transmitted. This is proved by their subsequent increase of capacity for the manifestation of power in the respective departments and tissues from which energy has been disengaged.

The consequences of repeated specialized muscular processes, however directed or misdirected, are easily seen. The inhibition and the local specialization are co-equal factors in controlling nutritive support of function. There gradually follows a permanent establishment of the supremacy of the

parts engaging in predetermined processes whose product is energy; while parts and processes previously predominant, whether morbidly or otherwise, are diminished, and, as is desirable, made to assume no more than their natural and wholesome physiological importance.

These statements of some of the principles of elementary physiological direction and support of power afford the following inferences:

Health is the concomitant, to some extent the result of the heterogeneous activity of mind, nerve and muscle; causing diffusion and therefore equability of nutritive effects. Health may be, and often is, injured by such partial and local nervous and muscular action as serves to *prevent* such necessary diffusion and equilibrium. This is *the* common cause of chronic ill health in civilized life, including that ultimating in hernia, and especially those forms relating to the female pelvis.

On the other hand, the capability of misdirection involves also the contrary, that of improved and amended direction of the physiological energies, and the permanent record of such amended action incorporated in local tissues of the body. The desideratum is intelligent command and guidance of vital activities. By this means the physiological activities and their products of energy, and the nutritive support of these, may be guided, concentrated and emphasized at any selected point—as at the faulty and failing locality—with unerring precision and all-sufficient force.

SPECIALIZATION BY RESISTANCE.

While the principles above stated are sufficiently obvious in relation to the voluntary muscles which clothe the limbs, their applicability in hernia is not so readily seen; at least the failure to apply them in practice would so indicate.

The difficulty lies not in the nature of things, but in the obstinacy of habit. The hands and feet are the almost exclu-

sive agents of the will, and the usual instruments for the manifestation of mechanical power. The power of habit in thus regarding these members serves to conceal the fact that the energies of the organism may be directed into other channels than these if the necessary conditions be supplied, which only need be the same as exist in the use of the hands and feet.

Another embarrassment to the conception of applying the same physiological conditions to the masses of muscle whose failure is the ultimate cause of hernia and allied affections, and whose restoration is their radical cure, is the rhythmic nature of the action of these muscles.

The existence of rhythm appears to convey the impression that the functions of these muscles are involuntary and only involuntary. The truth is quite otherwise. The chest and the trunk muscles yield obedience to the will whenever its incitation is brought to act upon them. The rhythmic muscles of the chest and abdomen are susceptible to cultivation by use in the same way as are those of the extremities, and to far greater and more permanent effect. This advantage is a consequence of their rhythmic function. Cultivation very soon merges into habitual increase of rhythm ; and this increase is self-perpetuating, and yields far less rapidly to the deteriorating effects of inaction, enforced or otherwise, than do other muscles.

The *one* condition essential for securing the high degree of specialized effect necessary for therapeutic purposes, has been too much neglected by physiologists and therapeutists. This is shown in the preceding section, and consists in opposition, *resistance.* Indeed, active power dissociated from resistance is well nigh inconceivable. Certainly it is resistance which gives direction and emphasis to muscular power, and the whole mechanism of vital organic dynamics.

If, as in the foregoing examples, the arm raises without the weight, so much vital energy as would have equalled the re-

sistance afforded by the weight, must have remained in some other form, through failure of the incentive required for its dynamic manifestation. The nutritive activities accompanying such development would have failed to occur.

When, however, the weighty body seized by the hand affords considerable resistance, the incitation is greater, and the will becomes more vehement, and muscular activity and its nutritive consequences rise to their highest pitch and their best standard.

The lesson afforded by these familiar illustrations from common experience is this. The supply of adequate resistance, and its proper and accurate adjustment to the desired end at specialized localities, insures the localized nutritive activities called forth by this relation; and these effects are susceptible of being carried forward to any degree required for therapeutic purposes, and their nutritive record remains a permanent legacy in the tissues.

HOW TO LOCALIZE SPECIAL MECHANICAL EFFECTS IN THE PARTS ASSOCIATED WITH HERNIA AND IN THE PELVIS.

The following physiological points require to be secured: First, to subject the muscles which usually act rhythmically to extreme incitation by the will, so as to overcome the inertia of the abdominal contents, by means of the muscles mechanically disposed for that use, just as a weight is raised by the hand. Second, to secure so much of the same action in the constant rhythm of the trunk muscles as to insure permanency, and immunity from all local consequences of their weakness and insufficiency.

To illustrate the physiological points involved to the satisfaction of the inquirer, it will be well for him to employ personal tests for their verification. To this end, let him place his hand on any part of the anterior of the trunk of another person, and pressing with decided force against the part

covered by the hand, wait a few moments for whatever consequences may ensue. He will soon observe that the hand thus placed rises decidedly and forcibly with every inspiration, and recedes as decidedly at each expiration.

Without moving the hand, let him command the co-experimenter to *breathe deeply*—as deeply as he can. He will now observe that the part covered by the hand not only rises and falls through a larger range, but that the *remainder of the trunk has become motionless*, as respects the rhythm of respiration. The whole of the air of respiration is exchanged through the exclusive effect of the rhythmic motion occurring under the pressing hand; and the presence of the hand and its pressure, that is, the local resistance, has determined the direction and the degree of the onflow of energy, both nervous and muscular, to the one exclusive predetermined point. The involuntary motion has become volitional; the usually diffused expansion and contraction has become concentrated to a very circumscribed region, which thereby gains the nutritive advantages flowing therefrom.

To vary, and still further substantiate the physiological principle of local specialization, let the pressure of the hand be applied to *any* localized part of the chest; to the sternum; to the sides; to the top; at one side, or the other—let it be thus applied to the abdomen, the epigastric, the suprapubic, the hypochondriac regions; each in turn. It will be found that the same consequences follow, viz., that of increased rhythm at the part covered by the pressing hand; a disposition to, and in general, complete inhibition, of motion at all other portions to which the rhythm of respiration would, under other circumstances extend.

This experiment may be carried to still greater therapeutic effect. Uniform pressure soon ceases to afford physiological incitation; alternations of pressure, which correspond in form with physiological activities of all kinds, afford a more legitimate form of incitation. Instead, then, of steady compres-

sion, let the pressure be increased and diminished with a rhythm agreeing with that of the motion assumed by the part compressed; and immediately the *degree* of motion is increased; and the volume of air exchanged at each respiratory act is correspondingly increased. By deft management of the incitation afforded by this means, the extent of the rise and fall of the part immediately covered by the hand will become surprising to one beginning experiments with reference to specialization.

It hence appears that the trunk muscles in which the rhythmic form of action is due, are no less amenable to the control of the will, and subject to voluntary motion, than those of the limbs; that such motion may easily be incited in this class of muscles at any location, even though it be quite limited; that these muscles, by affording them due degrees of incitation, will, in consequence, take on extreme degrees of action; that one consequence of such extreme incitation is partial or even complete inhibition of all opposing muscular activities; and that another, and the highly desired one in the kind of local failure which results in affection of the lower portion of the trunk, is greatly increased nutritive action in the dominating parts, and all the consequences derivable from such action at the region suffering the consequences of its deficiency.

CONCOMITANT CONDITIONS FOR ELEVATING THE DEPRESSED VISCERA.

The principles of physiological sustentation by means of vertical rhythmic motions extending to the pelvis, together with those of localization of physiological and of mechanico-physiological action with special reference to the hernial tissues and their connections, having been shown, it remains to prove the adequacy of these to accomplish the desired purpose in displacements, hernial and pelvic.

When the two hands of a person are tightly clasped and resting firmly on the top of the head, the following mechanical consequences in the form and manner of the respiratory rhythm are enforced:

1. The muscles connecting the arms with the chest-walls are rendered tense in the position of *extreme distention*, and the chest-walls are thereby pulled asunder, and *become fixed and immovable;* there is enforced suspension of motion throughout the exterior walls of the chest.

2. The rhythmic motions necessary for respiration being no longer possible with the walls of the chest, must now be wholly performed by the muscles of the anterior abdominal walls. The amount of air changed by the respiratory act, say 30 cubic inches, is, therefore, represented in the rise and fall of the abdomen to that extent.

The respiratory act becomes, in consequence, a vertical reciprocating motion of the whole contents of the cavity of the body; the visceral contents of the abdomen, as well as the lungs and their aëriform contents participating to an equal degree. This upward motion is necessarily opposed to gravitation, and, indeed, to all counter forces.

3. The amount of air displaced in respiration, and therefore, the extent of the vertical motion which, in the position described, is its necessary concomitant, may easily be increased by simply increasing the need or demand for air. This may be readily done, experimentally and tentatively, by running up a flight of stairs, being careful during the exercise to maintain the fixity of the chest, as before. It will now be seen that the vertical oscillation is converted into an *upward pulling;* it might be compared to pumping. This is because the ordinary requirement of respiration is multiplied by four or five; and instead of thirty, no less than one hundred to one hundred and fifty cubic inches of air are needed to liberate the dynamic energies expended under the changed circumstances. It follows that the vertical rhythmic motion of the

abdominal contents increases to an inch or even more in place of a fifth or fourth of that amount.

4. We may now modify the experiment and cause the greatest possible expansion of the upper portion of the body, which of necessity occurs chiefly at the intermediary region before described, *without* increase of respiration. Several ways of doing this will be described. The number of cubic inches that can possibly be changed, is the measure of fluctuation of chest space. But the lungs do not suffer corresponding inflation, nor, indeed, any inflation whatever. The lower part of the chest space becomes filled with other contents than air. Those of the abdomen are compelled to rise to the extent of the expansion, and its inferior wall, which is the diaphragm, is actually driven upward to the same extent. The weight lifted is not measured by that of the abdominal contents, but by the tension and the power of the muscles of the chest. In this case, the diaphragm rather resists the effect, and assumes the form of extreme concavity. The ultimate mechanical effect produced, is noted in the changed position of the abdominal coverings of the hernial region. The principle here shown may be regarded as the *key note* in the radical cure of hernia, pelvic displacements, and pelvic hyperæmia.

This experiment illustrates and enforces the physiological principle that specialized and localized effects are attainable only by eliminating all extraneous factors. By the method of exclusion, above shown, the whole of the mechanical power represented in the respiratory movements, both when at their least and at their greatest possible manifestation, is easily made available at a specialized region, just where its therapeutic value is needed at the hernial border and in the pelvis.

5. To the great power of the muscles converging to one purpose, in connection with the aid of atmospheric pressure, as above shown, may be added the no inconsiderable aid derivable from gravitation. Surgeons have practically found this aid to be of service in reducing hernia, even without the more

important assistance of muscular power, as above shown. When, however, gravitation is added to the forces above described, the mechanical effect leaves nothing to be desired.

In the horizontal position, hernial protrusion gives little trouble, because perpendicular pressure is removed. It is plain that were the gravitating force directed *from* instead of toward the hernial region, an important, though perhaps temporary point of considerable importance would be gained. To secure this effect, nothing more is necessary than to shift the position of the trunk so that gravitating force may be available in the desired, instead of the contrary direction. This recourse may not cultivate and direct processes of physiology, but is of service to those processes by increasing their intensity and effect.

VI.

Mechanical Difficulties—Taxis—Adhesions.

The process of returning a hernial protrusion to the cavity of the abdomen consists usually in urging it inward and upward through its canal by the hand of the skilled surgeon, and is denominated *taxis*. It is a direct application of exterior mechanical pressure upon the tumor itself, with such variations by manipulating about its neck as immediate circumstances may suggest. Whatever other aid may simultaneously be brought into requisition can scarcely be regarded as direct or of much mechanical or physiological account, the purpose being in general confined to that of diminishing systemic and local sensibility, and even of extinguishing it altogether. Means are also sometimes used to relax the general muscular system and the local tissues, so they shall not resist the mechanical purpose of the operator. Contributory to these ends is the free use of *opium*, *chloroform*, *ether*, and other drugs capable of suspending the vital functions of the nerves. In connection with the drug effects, those of extremes of tem-

perature are usually added—sometimes it is very high temperature, at others very low—secured by fomentations, by the spray or by ice. When it is considered that these aids to the process contribute nothing whatever to the direct force required for the operation of taxis, and that they diminish or annihilate the only safeguard against positive, perhaps fatal injury, it must be considered that they are of doubtful expediency. Without doubt, these means often complicate the process, and actually diminish the resources of the organic system and therefore of the operator.

In these endeavors, the abundant mechanico-physiological resources of the system that have been described are ignored, or imprudently wasted. These resources only require intelligent direction to become truly therapeutic, in the best surgical as well as medical sense of this term.

A single exception has been noted, as to the remedial assistance of inherent powers. *Gravitation* is sometimes made partially available in aid of reduction. In only a small portion of the text-books, however, are directions given for raising the hips of the patient while he is lying on his back during the process of taxis. The purpose of this direction is to diminish the troublesome interior downward pressure rather than that of securing the direct use of a mechanico-physiological force.

Taxis, when the term is limited as it usually is, to the act of direct manipulating and urging by the hand of an operator, often proves insufficient or worse, for several reasons, the principal of which may here be enumerated.

When there is no inflammatory or other morbid change in the hernial mass, and little or no impediment at the hernial neck, the protrusion is easily pushed back ; but, there being no permanent receptive capacity within, and no physiological force operating to oppose its reappearance, nothing is really accomplished. The mere return of the protrusion to

the abdominal cavity, effects nothing in relation to original causes, which constitute the potential factors of the affection.

In strangulation, not only are the same facts patent as respects retention and the potential factors of sustentation, but others of most serious import are present. The hernial mass is increased in size, at the same time the tissues included by the constriction at the neck are in a condition of actual disease, and will not tolerate rough handling. The distention of the capillaries thins their walls, and annuls their contractile power and elasticity. The contents of these vessels cannot be urged onward in their natural course by any exterior mechanical means, because occluded by the stricture; and the walls of these capillaries, thus rendered abnormally delicate, and having no outlet, are easily destroyed in the absence of the strictest caution.

Besides, the nerves of the part participate in these morbid changes, and are thereby rendered exquisitely sensitive; the least touch demonstrates taxis to be impossible while the consciousness is present; and it is necessarily perilous and foolhardy to practise taxis under the conditions stated when the consciousness is nullified by drugs. There is then nothing to guard against the perpetration of serious injury to the local tissues. Sensibility affords the advantage of protecting the patient against injury by a useless process.

The mechanical obstacles to the success of taxis are: the sharp edge of the narrow orifice formed by the inelastic tissues surrounding the neck of the protrusion; the increased bulk of the hernial mass; the tension of the vessels penetrating the mass with diminished power of resistance of their walls, now easily destroyed; and the nowise diminished operation of the downward forces to which the affection was originally attributable; and the absence of any increase of action, or improved direction of those mechanico-physiological forces which, in health, are prophy-

lactic, and in disease, are curative. To these may be added the purely physiological one of the safeguard of the sensations.

To these difficulties of taxis, another of a mechanical character, rendered conspicuous by the mechanico-physiological method, must be added, because adding greatly to a proper understanding of the subject.

The protruded portion of the bowel, under the circumstances stated, will not admit of being pushed in the true direction of the canal, even in cases where it is not tortuous, as it frequently is. The force applied to the exterior protrusion will, in the majority of examples, act upon the *sides* of the canal, and not in the direction of its longitudinal axis; or at the very best, against the resisting tissue encircling the neck. The internal orifice is small in comparison with the area of the exterior mass. The little resistance there may be, is, on mechanical principles, many fold increased by expansion of the superficial area of the taxis, and quickly rises beyond the reach of any practicable exterior force, even though it were advantageously applied.

The mechanical difficulty described may be thus illustrated: If the empty finger of a glove be passed through an opening a trifle less in size in a piece of card-board, the mechanical conditions of protrusion are tolerably represented. When an attempt is made to return the glove finger, by compelling it to recede by the exterior application of force, as by pushing against its side or end, it will be seen that the elastic object yields in any direction, and in all directions, rather than in the one desired. The soft and flexible fabric doubles upon itself in the most bewildering manner, seeming to increase instead of becoming diminished in bulk. The edges of the wall through which it was thrust appear to cling with the utmost pertinacity to their contact with the limp fabric; determinedly refusing retreat, and determinedly resisting all mechanical persuasions to expand and afford suf-

ficient space for inlet. The act of the through-thrust of the finger turns outward the inner border of the orifice, which every attempt to push back only causes to catch and hold the receding object more tenaciously.

The actual mechanical problem presented in most cases of strangulation would be more correctly represented by passing the glove finger, as before described, through *two* orifices, in *two* pieces of card-board, instead of one; these should be separated by a little distance, and not opposite each other. The consequence of exterior taxis can only be to crease and fold the protruded part, and thus cause it to engage more firmly at the resisting edges and points. The mechanical conditions are plainly such as to render success by the ordinary mode of exterior taxis well nigh impossible.

The mechanical difficulties above presented are easily resolved. In the illustration, a child even would see the advantage of substituting gentle *traction* for violent pushing. A small part of the force applied in the same axial direction, *but at the opposite side of the opening*, instantly removes all difficulty. The imprisoned fabric is extracted almost without effort.

In like manner the force to reduce hernia must, to be successful, be applied, not to the exterior of the protrusion, but to its interior, or abdominal portion. The following advantages arising from the mode indicated are obvious: The amount of mechanical force derivable from processes herein described operating interiorly for the return of protrusion, is immeasurably greater than it is possible by any means to bring to bear on it exteriorly.

Applied interiorly, the effective force reaches the protruding and presumably congested and sensitive part *through healthy tissues*. It is operative upon and through a comparatively large area of the continuous and healthy intestine. An essential part of the desired liberation is secured *before* the operating force even reaches the sensi-

tive, suffering, and protruding part. The extracting power applied within the abdomen, progressively relieves the morbid condition, including both the displacement and its consequences of congestion and pain, as it reaches gradually the damaged part. This method affords an extreme contrast with that which employs pressure instead of traction; to a limited instead of an expanded area; which pinches, instead of removing compression; and which is painful instead of pain-relieving.

Traction at the interior side of the protrusion is necessarily in the proper axial direction. The hernial canal is by this method straightened instead of being rendered tortuous; and no ineffectual and injurious impingement against the walls of the canal and the columns of the neck of the hernial canal is made. The whole of the force engaged is utilized for the purpose desired, in the correct direction and in no other.

The interior traction removes the folds of tissue which clog the hernial opening; the sharp, outward turned edges of the encircling fibres bordering the hernial neck are turned inward by the removal of the interior pressure upon them, consequent upon the reversal of the urging force. This causes increase of the size of the hernial opening, which further greatly facilitates reduction.

To be beneficial taxis must be employed in connection with the general principles hereinbefore set forth. The method of its proper use will be shown in connection with the details of cases wherein it is applicable.

ADHESIONS—IRREDUCIBLE HERNIA.

Inflammation of serous membranes of any part of the body is liable to cause adhesion of parts in immediate and motionless contact. Such parts become glued together by the plastic lymph which is usually freely effused under the cir-

cumstances. The membrane which lines the chest and also covers the lungs; which lines the interior surfaces of the joints; and which lines the whole abdominal and pelvic cavities, and is reflected over all the contents of these cavities, is of this kind, and may, under favoring conditions, form adhesions, obstinately preventing the gliding of the parts upon each other. Serous membranes, forming the lining of cavities are eminently adapted to surface motion nearly frictionless; this being the natural function of these tissues is therefore necessary for their health.

The circumstance therefore which most conduces adhesion of serous surfaces in contact, is *immobility*. This principle is well illustrated by the lungs, which are frequently found adhering to the walls of the chest in the absence of any history of previous inflammation to account for the fact; and even the surfaces of the joints become adherent when the gliding motion to which they are adapted has been suspended for a prolonged period, even in the absence of local inflammation.

The health of serous membranes therefore demands functional duty as its first requisite; and this consists in the gliding, or change of the surface contact of whatever parts are thus covered.

This principle which insists on the fundamental necessity of motion to the health of serous membranes, extends to all such membranes including the peritoneum which lines the abdomen and is reflected over all its contents, including the hernial sac, hernial protrusion and neck, and adjoining points of peritoneal contact.

The true remedy for adhesions, is manifestly the reversal of the conditions which favor their production. The chief of these is demonstrably, motion. Nothing of the kind is possible so long as motion is maintained. The supply of motion to adhering parts, of necessity liberates the adhering surfaces. The action may be at first but trifling, scarcely beyond that permitted by the elasticity of the tissues; but its

persevering continuance causes progressive increase of the extent of the motion. The consequence is that the adhering substance, which is always of low vitality and incapable of affording vital resistance, becomes broken up, and disappears by absorption. The process initiated and conducted in a tentative, but persistent and progressive way, is entirely painless, and affords unequivocal and positive results; the complete return of the lost capacity for motion, with the power of motion; and the normal condition of the membranes immediately supervenes.

This process and its consequences very closely resemble those following fracture of bones. The provisional callus consists of effused substance of low vitality, which is rapidly removed on the return of motion in the part in which the callus is formed. Similar conditions appear in cases of fixity of joints, of pleural adhesions, as also in the peritoneal adhesions following hernia. The favoring condition in the latter case, as in the others, consists of enforced immobility.

The convoluted arrangement of the digestive tube and the freedom from mechanical restraint of the appendages of the digestive organs, particularly the omentum, provides for the gliding of these parts upon each other and upon the interior surfaces of the containing walls. Indeed this mechanical consequence is inevitably produced by every motion of the trunk in whatever direction. It is by no means a strained inference that such motions are therefore healthy; because thereby the separate parts are caused to shift their position and to glide upon each other, and thus obviate the injuries arising from continuous contact.

The adhesions coincident with hernia occur in this way. A loop of intestine points persistently in the same unchanging way to the same peritoneal point. The compression from above compels the contact points to engage in close mutual relations, which would be destroyed by lateral or surface

motion, or by alternations of pressure. The wedge-like loop insinuates itself among, or between yielding tissues, which have no protective and preventive recourse or alternative. The gliding of the surfaces would both blunt the point of the wedge and apply it to a succession of resisting parts, instead of a yielding part. The occurrence of adhesions under these circumstances is entirely impossible. The restoration of the same gliding motion becomes therefore indispensable for the removal of adhesions, and the cure of whatever affection they may be an integral part.

The processes for restoration of motion must of course be at first tentative; the sensations are a sufficient guide. Afterward the parts may be engaged in exaggerated degrees of motion with perfect comfort, and with highly curative effects. This not only causes solution of continuity of the adhering surfaces, but causes absorption and removal of adventitious tissue and substance. Of the power and efficacy of the special processes pointed out for securing these results there is ample proof, and this is of a nature permitting verification, even by the unskilled.

The adhesions of the interior organs at and about the hernial neck are the most prominent cause of irreducible hernia. The mistake in the treatment of this variety is the attempt to reduce suddenly—to suppose that the adhesions may be overcome at once if at all, instead of progressively. A little reflection would indicate that, even were the sudden removal of adhesions possible, no advantage is gained till the powers of natural sustentation are developed. These, in the nature of things, must be progressive, and not instantaneous; by process of growth, and not by unintelligible magic.

The reader can now see more clearly than before the necessarily damaging effect of the truss. Its influence is to mechanically oppose the gliding of surfaces it is so desirable to promote; to produce immobility where mobility should be increased; to superinduce the formation of adhesions, and so

prevent the restoration of the lost physiological activities whose outcome is hernial manifestation.

In the progress of diseases of the contents of the female pelvis, the separate and distinct organs sometimes lose their mobility and become inextricably fixed in some morbid position, and adhesions demonstrably exist. To sever such adhesions by sudden, forcible divulsion, is painful and unnecessary. The separation and restoration of mobile power may however be achieved, even in the most obstinate cases, by the progressive, mechanico-physiological method, which is entirely painless. The effects of sudden divulsion cannot be permanent, because the requisite power of gliding of the distinct organs upon each other is not conferred or even attempted. The latter method secures not only divulsion but its permanency, because it is achieved not by mere separation of adhering parts, but by development of the gliding motions which we have seen to be entirely incompatible with the existence of adhesions of serous surfaces. These facts explain in part the remarkable results often secured in old cases of uterine retroflection and other obstinate forms of pelvic diseases by the improved or mechanico-physiological method.

LOCALIZATION OF MECHANICAL EFFECTS.

The reader who has had no advantages from experience and observation in testing and verifying the principles of the mechanico-physiological therapeutics of hernia, may be bewildered by the apparent lack of localization in the remedial principles, and even of the processes herein set forth. How, he may inquire, are processes which engage, perhaps, a large portion of the muscles of the whole frame, to become locally effective? and how can an upward motion of the anterior wall of the abdomen produce the desired special effect at the circumscribed hernial area?

This difficulty exists only in the understanding of persons

unfamiliar with mechanics. The real nature of the facts involved will be better understood by reference to familiar examples of mechanical action, illustrative of a law which equally reigns in the mechanics of the organism.

The mechanical law involved is this: Under stress, the resisting object yields at the weakest point, and nowhere else. The fact of local yielding relieves pressure throughout the remaining area. A chain breaks at the weakest link, and not only does not partly break at other links, but these are thereby relieved of strain. A bent stick easily breaks where it is notched—the remainder does not even bend. A cork flies from a bottle of effervescing contents, because its adhesion is less than that of the body of the glass. It is as readily driven into the bottle, when the superior force is in the opposite direction, as the child, suddenly cooling the steaming contents of a bottle, readily discovers; condensation, a fact existing not only near the cork, but throughout the interior, forces the cork inward. The cork illustrates the protrusion.

In boiler explosions, the line of fracture is identical with the line of least resistance. In collapse, the same principle is equally applicable. The remainder of the shell is unaffected, except possibly in slight degree from the momentum caused by suddenness.

In relation to hernial protrusion, the abdominal wall is a diaphragm having a weak and unresisting point, as in the above mechanical illustrations. This is, of necessity, under the control of dominant forces, and yields to the exterior and interior mechanical play of these forces. The true therapeutics of hernia consists in increasing the dominancy of the interior force acting inwardly; and even the cavilling inquirer may be certain that the greatest apparent effect will be manifested at the point of least resistance, or the hernial area. Hence, in returning the hernia by the mechanico-physiological process, the whole mechanical effect becomes

effective at the hernia, and disturbs no other part of the wall.

The location of a hernia is the point which has least power of resistance of any in the abdominal wall to the combined forces brought against it. The existence of the protrusion is the demonstration of the fact stated. There is but little resistance before, none whatever after the protrusion, because the resisting tissues have been pushed aside. There is nothing but the elastic peritoneum, the equally elastic skin and the intermediate and yielding connective and cellular substance, having each and all but slight mechanical resisting power.

Now, hernia is possible only in case of the inadequacy of the interior forces, which have been deteriorated, perhaps quite annulled. Hernia is therefore not related to exterior opposition of a mechanical nature. Its complications do not afford exceptions.

VII.

The Local Tissues of Hernia.

The nature of the mechanico-physiological facts of hernia has seemed to demand extended explanation, because clear views are essential to their therapeutic availability; because the powers involved have not been generally understood or even recognized; and because the knowledge of the facts stated are of inestimable value to medical science, without regard to sectarian prejudices.

It would be incorrect on the other hand to infer that the remedial methods based on the principles above explained involve a neglect of the local tissues, those which have suffered distention and divulsion to form the hernial protrusion.

The two concurring circumstances in the production of hernia are, first, the superincumbent weight of the abdominal contents, and the exceptional addition to gravitation, that

from inverted or at least ill-timed muscular action; second, the weakness and defective resisting power of the local tissues. The hernia is not cured by removing the latter difficulty, but still exists, potentially, even though concealed by the truss pad; while by removing the former, that is, by increasing the sustaining apparatus, the local tissues are coincidently increased in power. The first thing in order therefore is the cultivation of muscular power. The increase of resisting properties of all the constituents of the tissues overlying and surrounding the protrusion is the natural and necessary consequence of increasing their physiological duties. The substance of the tendons, ligaments, membranes, connective tissue, and whatever is acted upon, and made to act, by the mechanico-physiological processes prescribed for this special purpose, are quite certain to increase their hardness, size, and all the qualities implying resisting power; just as similar anatomical constituents of the limbs under similar circumstances become strong and resisting. Only by non-use and neglect, these degenerate become soft, flaccid, and incapable of resisting mechanical impressions. The effect can be reversed, only by reversing the cause. But for therapeutic purposes, any mechanical stress aiming to restore function and power must be tentative and gradual. Local soreness and possible injury may result from too rapid and injudicious imposition of burdens which it is the purpose of treatment to prepare for, rather than to supply. The desired properties of vital tissue are the product of judicious use; but the acquisition of resisting power by due cultivation, may be carried to an almost incredible degree.

The securing of these mechanical advantages through cultivation is even more feasible and more permanent in case of the hernial tissues than in that of the limbs, to which so much attention is often given. This is because all cultivation of power of the respiratory rhythm is self-perpetuating —the special effect is resolved into natural involuntary action,

which goes on night as well as day, thus automatically securing its own continuance. In case of the extremities and the muscles outside the rhythmic function, the muscular action being entirely dependent for its incentive on the will, is necessarily fitful and irregular; and besides, the nutritive support resulting therefrom, is divided between the muscles and the nerve centres connected with the will power.

The remedial method known as radical cure, elsewhere discussed, is a full, though unconscious recognition of these principles of need for increase of the local power of mechanical resistance. As, however, it proposes to supply nothing vital to the weak part, and at best is only a substitute for the truss pad, which again is certainly not what is really desirable, but only a substitute for sound local tissue at the culminating point of defect; it is plain that in neither case is physiological development contemplated or indeed possible; and no actual recovery can occur, since this can be the result of development only. The futility of attempts through other channels is a foregone conclusion; but the failure of methods referred to, should have the effect of laying bare the real and indispensable need, and of suggesting the direction which remedial inquiry should pursue. The attainment of the real purpose is practicable; but only by the direct, not by substitutional methods.

The mechanical structures of the organism may be understood as being composed of two distinct classes: the generators of mechanical energy, the muscles; and the recipients and transmitters of such energy, as the bones, tendons, membranes, and those parts generally composed of connective tissue and its modifications. The muscles are subject to rapid change of substance; while the passive or recipient tissues act only as acted on. The nutrition, that is, the maintenance of the integrity of any tissue, is absolutely dependent on use or function. When, therefore, the abdominal muscles are functionless, or nearly so, from defective rhythm and insuffi-

cient ordinary action of the trunk muscles, the tendons, aponeuroses, and connective-tissue substance in general which enters into the anatomy of the hernial region, must suffer deterioration, become unresisting and incapable of fulfilling its local duty. The principle holds true of even the bones. The existence of hernia is abundant evidence that the principle is as true in its application to the constituents of the hernial region as it is in any other portion of the body.

However desirable it may be in hernia to promote the development of good, strong, compact and powerfully-resisting mechanical structures in the hernial region, nothing is plainer than that the ordinary remedial treatment of the affection is in direct contravention of such apparently well-established principles. The truss-band restrains the action of muscles, and therefore the energy which should be transmitted to their tendons and other structures of the hernial region; the pad still more promotes absorption and wasting of these tissues to the extent of its pressure, while the influence of the substitutes for this device are, if possible, still worse; and all fail to recognize the main principle through the operation of which any approach to cure is possible.

It is a perfectly correct inference that the remedial treatment demanded by all true physiological and therapeutic principles, is exactly contrary in its nature and form to that traditionally provided. This consists in general in the intermitting pressure and action supplied from the muscles normally adjusted to act upon the hernial tissues, the *white* anatomical structures of the hernial locality. Such action increases their nutrition, their substance, and their resisting qualities.

The effects inaugurated by muscular action may easily be so directed as to converge at the hernial region; may be intensified in proportion to the extraordinary local need; and the action may be relied on as effective in the desired direction.

But the therapeutic advantages of mechanico-physiology are by no means limited to the effect of muscular action on the muscles themselves, and on the tendons, and other anatomically-related local tissues that may be at fault. It is not even necessary to wait for the development of muscular power, and for the extension of natural rhythm to the faulty region. *Massage* imparts to the local tissues similar pressure-motions to those naturally due; it supplies the incentive to local nutrition, which may thus be secured to an extreme degree. Massage may be applied locally without limit, and is as certain to cause increase and hardening of the local tissues at the seat of hernia, as are similar causes to produce similar effects in other situations. This is witnessed in case of the hands and other parts subjected to pressure-motions of laborers. Local massage, whose power is derived from appropriate mechanism, is often of the highest importance for securing the desired improvement of the resisting properties of the local tissues of hernia.

The extreme disparity between the two methods of treating the local weakness of the hernial tissues is worthy of remark. By the truss, the abdominal muscles are confined and their action restricted; and the resisting tissue with which these are connected at the hernial region allowed to weaken and become useless. The pressure of the truss pad at the very point where strength and resisting power is required, is the certain means of producing absorption of tissues upon which such pressure rests. Everybody knows the local consequence upon the compressed flesh of wearing a garter where the pressure is distributed over a much greater area.

The effect of local massage is exactly to reverse these effects. It supplies the means for exaggerating nutritive support; for local development of tissues; and for the almost unlimited increase of local mechanical resisting power —effects which follow in the ratio to the judicious employment of the means adapted to that end.

VIII.

The So-called Radical Cure; Its Methods and Their Value.

By radical cure is understood the permanent and entire obliteration of the affection to which it relates. Investigation of the plans proposed for curing hernia soon revealed the fact that the exterior protrusion only, is contemplated by the curative processes, and not its causative and producing factors. Any one who has given due attention to the principles which have been presented in the foregoing pages will arrive at the conclusion that not having an adequate foundation, all proposals to remove completely and permanently the local manifestation by local remedies must fail in practice, however plausible such proposals may appear. It is more reasonable to question the validity of the testimonials relating to such cures than the principles of mechanico-physiology whose reign is universal.

As, however, radically curative effects are claimed as flowing from a variety of purely topical methods, and as these claims are very captivating, by which numbers are liable to be led to disappointment, it is due that the reasonable inquiries of sufferers relative thereto should be answered.

The end contemplated is proposed to be reached by rendering the hernial canal in some way impervious to the portion of intestine or omentum presenting at its inner opening. Were this feasible, the effect would be that of superseding the truss and its pad by causing a substitute therefor in the tissues themselves; an obstruction equivalent to that of the pad in preventing protrusion.

It is proposed to gain this end by taking advantage of a well known law of the vital economy. This relates to nature's method of repairing injuries, such as mechanical accidents. Whenever healthy vital structure receives a wound, as a cut,

puncture, or rupture, there immediately follows an abundant effusion from the contiguous blood-vessels of a reparative material, called coagulable lymph, into the surrounding parts. The solidification of this material appears to be designed to mechanically cement the severed parts, preliminary to the more vital and permanent reparation which follows; and also so to restrict the circulation, especially of the inter-vascular fluids, as to prevent diffusion of infected matter from such wound to the general circulation. Thus nature intends at once to prevent displacement of severed parts, till they can grow together, and to prevent injury to the general system arising from local septic or other infection.

The so-called radical cure is nothing more than the superinduction of this reparative process by inflicting a local injury in the walls of the hernial canal. The necessary preliminary is to cause such injury of the hernial tissues as to superinduce local inflammation or something akin to that process, to secure the local effusion of plastic lymph destined to cement the hernial opening. It is the agglutination of the canal and the surrounding tissues with an effused solidifiable exudation which constitutes the essential part of this radical method of remedying hernia.

There are several ways proposed and practised aiming at the one effect, each of which is known by its inventor, each having its advocates and reported successes. Some of the most prominent and specious of these will be here enumerated, to show the limitations and defects which in the nature of things, must be common to all of this class of remedial processes; and also that the shortcomings always developed, exist in the principles rather than in imperfection of the details of the methods.

The Method by Means of the Truss.—Several of the advertising truss manufacturers insist in their circulars that the special form of instrument they represent, will cause agglutination of tissues and the formation of a permanent obstacle to

protrusion. As this announcement finds easy credence on the part of the sufferer, already prepared by the torture of successive trusses, and still under the stimulus of strong desire for emancipation from instruments, it may be pardoned human nature not fortified by the facts of general experience, if the radical proposal proves a captivating bait to purchasers. The difficulties inherent in the method pointed out on preceding pages are either ignored, or the mode of removal left ambiguous, to be precisely determined by still further experience. And as the essential element of *time*, in which the proposed effect shall be secured, is always wisely omitted, it is clear that no complaint for non-fulfilment of promises can be brought. The happy consummation is always in the hopeful future. A subterfuge may be intended on the part of some of these pretenders to impossibilities; while the appearance of unmitigated veniality is softened by the spontaneous cures which sometimes occur, brought about by undesigned and unnoticed improvement of conditions, working without credit and in spite of the instrument.

The medical journals contain from time to time accounts of new inventions, instruments, and processes designed to compass the end implied by the name of radical cure of hernia. To show the similarity of scope and purpose contemplated by these, descriptions of a few are here given.

Dr. John Wood's Operation.—This consists in the closure of the abdominal hernial rings with sutures. Adhesion is expected to follow, producing occlusion of the canal.

Joubert's Method.—Inflammation is produced by the subcutaneous injection of a few drops of the solution of iodine, cautiously repeated at intervals, as the judgment dictates.

Wutzer's Method.—The scrotum is thrust up into the inguinal canal, a wooden concave case is applied, stitches are taken through the tissues, and the whole compressed by the application of screws, so as to cause adhesion of the inthrust parts, to the borders of the hernial ring.

Heaton's Method.—The injection into the hernial canal of a solution of tannin and a little morphine, and repeated.

Galvano-Cautery Method.—Needles plunged into the borders of the hernial tissues, and heated by a strong galvanic current. Superior effects are claimed for this method from the well known tendency of burns to be followed by contracted cicatrices. The connective tissue disorganized by heat seems to be less capable of perfect reproduction.

Dr. J. C. Hutchinson gives an account of cases in which the sac was surrounded with a ligature and the whole was cut off, followed by healing and obliteration.

The above will serve as examples of many others found in current medical literature, and in works of surgery; all however treating the affection as simply local, and ignoring any other or ultimate source.

The benefit promised by recourse to any of these methods is not immediate and positive, but remote and conditional. They are subject to the following drawbacks:

The patient must be kept in bed for several weeks, or rather for an indefinite period, and is finally allowed to assume the perpendicular position with the utmost caution. This shows that at best, it is only the effect that is attempted to be remedied, and that the most ardent of radical operators does not consider the precedent conditions of the affection as in the least abated. When the patient is finally allowed to go about, it is always insisted that he must wear a truss for an indefinite period.

The local inflammation, superinduced in the hope of benefit by either means described, is subject not merely to practical difficulties, but to dangers. The foremost of these is the possibility that the inflammation succeeding the operation may become uncontrollable, and carry destruction in place of healing in its course. The inflammatory action may assume a morbid type, as the erysipelatous, or septicæmic form; it may extend beyond the intended limits and invade

the peritoneum with which the hernial canal is continuous; a consequence which no judicious surgeon invites except under the direst necessity which is not presented in this class of cases. In these days of knowledge of sepsis he is not a good surgeon who wantonly exposes his patient to such perils.

The conclusions arrived at by the experience of surgeons of eminence is entitled to weight.

Says Druitt, of spontaneous cure: "The herniary aperture may become entirely closed and the neck of the sac obliterated, the cure may occur *in two or three years.*"

Again: "As to attempts at radical cure by cutting, causing slough by burning or otherwise, the less said about them the better."

Says Minor: "Radical cures fail, not from faults of the operation, but because the adhesions are not firm enough to sustain the pressure from above, and that of the truss-pad from below."

Dr. Frank Hammond: "The operation is ingenious but will meet the fate of all operations which have been tried and condemned. It depends for success on those temporary *products of inflammation which constantly disappear* on the restoration of the tissues to a healthy condition."

Dr. Haywood: "No surgical operation known can be relied on to produce a radical cure of reducible hernia."

Dr. Faile Clark: "Any operation for radical cure is an unjustifiable one."

"The history of these (cases of radical cures), usually extends no further than the operation itself, and not to its permanent consequences. Radically cured cases are now wearing trusses while parading before the public as cured cases."

It hence appears that even when the perils incident to local operations for radical cure with the subsequent probation of "in bed" and truss wearing are happily past, the probability of any advantages from it are exceedingly meagre. The most fortunate result is not health nor even a tolerable substitute

for health of the parts; for nothing really vital or permanently mechanical can be thereby gained. The effused material is not a product of health, or a consequence of development. It is nature's temporary recourse, and its effects do not extend beyond the occasion which call it forth. Such effusions, of whatever consistency, are certain to be removed soon after the return of the advantages of natural, wholesome, bodily activity.

This result is only in accordance with general laws, reigning throughout the organism. The swelling of an acute abscess, which is composed of similar material, soon disappears. The provisional callus which occurs after fracture, after serving its temporary local purpose of fixing the contact and restraining the mobility of the parts, is also removed, leaving not a trace behind. There is no known method of preventing the absorption of supererogatory material in the healthy condition of the organism.

The remedial methods which, following their advocates, are here designated as radical, whether the means be the truss, or the wound-producing operation, are essentially the same, because in either case the effects immediately superinduced are essentially alike; and because the same radical fault attends them all. This is the failure to recognize or provide for any defect beyond the seat of the manifestation. The essential factor, without which the hernia is impossible, —the mechanico-physiological one, is equally ignored in every so-called radical method. The inference is plain that the advocates of radical operations do not regard the return of health to the general system as being necessarily connected with the local cure, and bestow upon it scarcely any attention. This is manifestly a reversal of the order demanded by correct therapeutics.

Isolated tests or *provings* of the radical methods in any of the varieties above mentioned are, in the nature of things, impossible, and therefore reports of successes are valueless

as evidence. This is because the patient is, at the time of the experiment with the radical method, subject to the powerful influence of the natural order of physiological events, to which all, the hernied and the unhernied, are alike exposed. It follows that reported cures are more probably the effects of the usual dominance of physiological activities. These are more powerful and far-reaching in their nature and scope than the interposed curative process. This probability is transformed to certainty by the development of the mechanico-physiological idea; since it is shown that nothing more than a judicious cultivation of the powers inherent in the system, whose defect is made manifest by hernia, is required to cure hernia. Hernial affections exist potentially, anterior to the period, as well as interior to the point of manifestation. They are then in an embryo, or developing stage, surely presaging the subsequent, advanced stage of development, when they become obvious to the senses. The advanced stage is but a superaddition to preceding inferior stages, and *not* a new thing of another sort.

The utility of instruments or operations in this concealed stage of the same thing is inconceivable. No question has yet arisen involving exterior mechanism. There is nothing to beguile the judgment. Yet it will be readily admitted that this early stage is a proper one for medical advice and benefit; and that such benefit must arise solely from the correction of the causes of the progressing morbid development. The defects in mechanico-physiological activities demand improved conditions for perfecting them. The morbid products in even the mechanical phase, are removed coincidently with the correction of morbid processes; which, in their last analysis, are but an inferior degree of the physiological processes due.

The mistake in the conception of hernia, fatal to the efficacy of all topical remedies, is essentially this. It is regarded as local, isolated and mechanical. This conception

is inadequate; including, as we have seen, only a portion of the facts, and these the subordinate; while the causative and potential facts are neglected. The defects of etiology are represented in therapeutics.

The contents of the female pelvis unfortunately furnish a similar field for futile and injurious experimentation, in the hope of securing radical cure for affections pertaining to its organs. These affections so far as relates to malposition, and the consequences imputed to that cause, are entirely analogous to hernial protrusion. It is therefore perfectly natural that those who regard hernia as an entirely local affection, neglecting its causative factors, should place the same pathological estimate upon the more obscure affections of the female pelvis, and endeavor to effect their radical cure by similar means. The body girdle, the pessary and the combination of the two, are but modifications of the truss, adapted to comply with the same supposed requirements, the point of application only being somewhat removed from the seat of external hernia. The similarity and the differences of these two classes of affections are well denoted by the contrasting terms *intrusion*, when the manifestation relates to the contents of the pelvis, and *extrusion*, when it is external, visible and palpable. The location, mode and form of manifestation are subordinate, and do not materially effect the principles on which these manifestations occur, their essential nature, or the principles of effecting restoration. The ostensible use of instruments is to raise the uterus to its natural position, and to retain it there till the natural supports shall acquire the strength necessary to dispense with the substituted support. Depression, or as it is popularly called, prolapsus, and its consequences are thus theoretically cured.

The reader already knows that the pelvic contents are not naturally supported by obstacles being thrust beneath them. This is even more opposed to natural indications

than is the truss pad for hernia, since in the latter instance there is an opposing abdominal wall; while in the former, the vaginal outlet affords no comparable obstacle. The latter fact indicates that underlying support is uncalled for, and that devices for that purpose contribute nothing to natural support. It may here be repeated that the actual support of the pelvic contents, like that of the abdominal, consists mainly in organic rhythm.

The disadvantages of the pessary are even greater than the truss pad. The former is thrust among parts naturally in juxtaposition. Its pressure superinduces absorption of the muscles and connective tissue to as much greater degree as the surfaces under pressure are more extensive. It collects secretions and detains them till decomposition occurs. It has no certain resting place and is always liable to obstruct the natural passages.

The futility of the attempts to effect the radical cure of hernia by operations, surgical or other, confined to the seat of the manifestation, is paralleled by equally or even more futile endeavors to cure the pelvic outcome of the same causes. This outcome being diversified by many subordinate causes, and divided in unequal degrees among several distinct parts, serves to render its real nature and source obscure, and therefore favors the endeavor to remove these effects by local means. The multiform appearances presented suggest a diversity of local remedies, often applied in succession. The whole, taken together, is a counterpart of the topical radical measures for hernia. The therapeutics are conceived under the same mistake as to the potential factor. The remedies are irrelevant to the requirements of the controlling cause, and cannot effect its abatement; at most, only its modification. And whatever good effects appear to follow the topical remedy, are of necessity, attributable to other than their actual causes.

In the light afforded by mechanico-physiology as presented

in preceding pages, the radical cure of affections of the pelvic contents having their source in mechanical displacement or hyperæmia, or both, may be sought in vain through so-called local support or topical appliances, for the same reasons that these methods are confessedly and demonstrably inadequate in hernial affections.

IX.

Rectal Affections: Constipation, Piles, etc.

The beneficent application of the principles inculcated in the foregoing pages is by no means confined to any specific form of pelvic disease. The same facts appertain to all the contents of the pelvis; the same causes are equally productive of morbid effects of the different anatomical parts contained therein; and these effects, comprising a long series of derivative, objective, and subjective phenomena, are remedied by adaptations of similar mechanico-physiological processes. The mystery with which the affections of the pelvic contents have apparently been enshrouded, is practically laid bare; the patient as well as the physician have a practical and efficient remedy at command.

The inferior boundary of the abdomen is the pelvis, just as the hernial region of the abdominal wall is its anterio-inferior boundary. The spaces of the two cavities communicate; the contents of the two cavities are in mechanical juxtaposition; and are therefore of necessity subject to the same mechanical influences and impressions from whatever source.

The mechanical obtrusion of the abdominal upon the pelvic viscera is easily conceivable; the more so when there is nothing to prevent it, which is the case in proportion as physiological sustentation is diminished.

The broad opening of the superior strait of the pelvis offers

an area rivalling the hernial region in the degree and extent of its exposure to the consequences of uncontrolled and unintermittent gravitation, re-enforced as it usually is by other forces or causes of compression. The intrusion of these overlying abdominal contents into the pelvis results in mechanically crowding, displacing, and deforming the pelvic viscera; and forcing these, in any and all the varied ways possible, into abnormal relations. The inevitable mechanical consequence of the operation of this cause is the mechanical yielding of the helpless pelvic viscera. The local protection afforded by attachments of these viscera to the rigid pelvic walls is such that this yielding is usually by segments, and the special forms assumed are determined by local and often transient circumstances, which have not the least influence on the general mechanism, and to which more consideration is due, in a therapeutic aspect, than is generally accorded.

From the above view of the subject it will be understood that the mechanical correlative of hernial protrusion when taking effect in the pelvis, is, if the term may for the purpose of illustration be allowed, *interior protrusion*, which becomes cognizable only by mechanical effects in some portion of the pelvic viscera, corresponding to the exterior manifestation of hernia.

The pathological consequences of defective sustentation and the resulting unintermittent compression of the contents of the pelvis, may be considered in two ways; the primary or mechanical, and the secondary or derivative; and are best considered in connection with the separate organs affected.

The pelvis in men contains the rectum, which is the last segment of the digestive tube; the bladder, and certain appendages; in women there is the addition of the generative intestine, consisting of the vagina, the ovaries, the fallopian tubes and the uterus. These are the organs exposed to the consequences of unintermittent compression, from defective mechanico-physiological sustentation.

The rectal sphincter, for obvious reasons, is adapted to supply a large amount of local resistance. This resistance is sometimes entirely overcome by the operation of causes before explained as resulting in defective sustentation. A sphincter weakened from any cause, of course allows such a consequence the more easily. The rectum or a portion of it is then pushed quite through its sphincter. It becomes prolapsed, and even strangulated.

This accident affords the medical inquirer a special opportunity. He may in this case easily and satisfactorily test the practical value of the principles herein explained. When, on the employment of the appropriate mechanico-physiological processes, described in detail in this book, he *sees* the protruding rectum disappear, he no longer doubts the adequacy of the processes to effect the result. When, again, he finds that a few repetitions of the processes are sufficient to remove all tendency to a re-appearance of the prolapse, he is assured of the radical nature of his remedy.

Far more frequently the consequences of defective rhythm and sustentation are not manifested exteriorly to the sphincter, but interiorly. The effect therefore assumes a different form, but is practically similar. Unfortunately for therapeutics it is invisible, or so nearly so as to afford misleading indications, because the connection with its cause is only rationally, not visibly obvious. The real nature of these cases is revealed by therapeutic demonstrations.

We may be aided to a correct apprehension of the mechanical consequences to which the rectum is exposed, by the close analogy of its situation to that of the uterus. These organs are in fact subject to the same mechanical control, and therefore suffer similar consequences from the same mechanico-physiological defects. The uterus we know to be often bent, or partly folded upon itself, producing interruption of outflow of its secretions. The rectum, while more bound by its peritoneal covering, is yet subject to similar effects from over-

lying causes. It is the inferior extremity of a tube having an enormous upward extension. It is therefore compelled not only to receive the weight, but also the consequences of the downward muscular urging of this continuation of itself. The mechanical effect is a tendency to local plications and folds, quite analogous to uterine flexions. These offer mechanical obstruction to the natural delivery of fecal residual, the functional duty of this part of the bowel. The evidence of this is not only in the retention of fecal matter, but the consequences on the rectum itself of such retention. Physical examination of the rectum in these cases of obstinate constipation often reveals its enormous expansion into a kind of pouch, affording a receptacle for large accumulations of residual. The rectum loses its contractile and therefore its expulsive power, on account of extreme distention and thinness of its muscles. The nervous sensibilities become nearly obliterated by the same causes. Both the muscular and nervous elements fail to react to the impression of aperients, and indeed this class of remedies is not in the least indicated, in spite of the severity of the constipation. The remedy required is that which shall remove the superincumbent weight, and with it the plications, folds, and flattening of the rectal tube. Frequently, even this only mitigates the severity of the constipation. The complete and permanent cure requires the development of the muscular tissue and the restoration of the nervous reflex natural to these parts; these are secured only by appropriate painstaking processes, whose aim and result are development.

Another very common form of rectal disease, the real nature of which appears to be often practically misunderstood, is *piles*. The forms assumed by this affection are varied; it is manifested as tumors produced by expansion into receptacles often of considerable size, of the terminal capillary twigs, sometimes interior, at others exterior to the sphincter. These surcharged tumors are sometimes relieved by spontane-

ous bleeding, sometimes not. These variations are subordinate, and do not depend on the causative factors; the removal of which is equally efficacious for the cure of all varieties of this affection.

Piles are only one of the many ways in which pelvic hyperæmia is manifested. The blood fails to return through its appropriate channels, less from any local fault, than from that of the causes physiologically assigned to that duty, and in health competent to secure such return.

As respects the rectum, defective rhythm operates in two ways. It fails properly to antagonize the gravitation of the superincumbent mass, and therefore permits persistent folds in the alimentary tube and in the mesentery; these afford mechanical obstruction to the venous or return circulation. The same cause also withdraws the most effective of the causes of the onward and upward motion of the contents of the veins, especially those bearing the portal blood from the digestive organs. These causes mechanically combine to obstruct the return of blood from the rectum, and therefore allow distention of the venous twigs which constitutes piles. The influence of these causes is fully known only by their removal by mechanico-physiological means; these afford positive demonstration of the correctness of the statements now made.

Another contributory cause should always be mentioned in connection with piles, which is fully under the control only of the patient himself. This will be understood if stated as being obstruction of the liver, through which the portal blood flows. Such obstruction arises from what, in the author's work entitled "Massage," is denominated an excess of suboxides in the blood and system, betokening insufficiency of the depurating functions. All modes of treatment of piles fail of lasting effect, when the sufferer neglects to obviate this, which is prominent among the producing and controlling causes of the affection.

The sufferer from piles (like those afflicted with other forms of pelvic disease), is generally too willing to be treated for the disease by means which have no relation whatever to its causes. That is to say, he surrenders himself a willing, credulous victim to empiricism. He would wearily dip the water from a dammed stream, into which fresh and unchecked currents are perpetually flowing. He is inclined to entertain the promises of ready cure with which he is plied on all sides. He submits to excision of the pile tumors by the knife or scissors; to their removal by ligature or other modes of pinching; to acid and alkaline caustics; to intra-injections of all sorts, devised by ingenuity which industriously seeks how not to understand the radical and contributory causes, so as to apply the appropriate and philosophical remedy. It is almost needless to say that the local destruction of piles by whatever method cannot affect their causes in the least degree; these remain as affluent of consequences as before. This is proved by the almost certain re-appearance of the tumors, often in a short time after their total ablation. The cases in which there is spontaneous abatement of the causes may occur coincidently, but these are exceptions.

The similarity of the cause of piles to that of uterine displacement and hyperæmia, and of hernia, is proved by the corresponding similarity in the procedures resorted to for the cure of these different forms of manifestation. The local applications to pile tumors bear a strong analogy to those employed for uterine affections and for hernia, in their intention and effect; the purpose is concealment and local repression rather than that of removing their sources. In each case, the ultimate causes without which the manifestation would be impossible are misapprehended or quietly ignored in the haste to remove the evidences.

It has been established by experience abundantly confirmed that piles require no other remedy than the restoration of the normal organic rhythm. If the patient would

have this remedy act promptly, and so take rapid and permanent effect, it is only requisite that his dietic and hygienic habits be so far amended as to obviate the presence of a large surplus of *sub-oxides* in the system, a condition usual to this class of subjects. This matter is under complete control of personal habits, for which the subject, and he only, is responsible.

CONSTIPATION.

This symptom is so prevalent and troublesome in civilized communities that it seems proper to extend its consideration beyond that connected with inertia of the rectum. It is often much more than a pelvic symptom, which implies that the inertia extends to the large intestines, and indeed throughout the extent of the digestive organs and their appendages. It is so often closely associated with affections of the pelvis, that the inference is natural that it may be clearly attributable in a vast number of cases, to the same cause, viz., defective organic rhythm.

This is indeed the case so far as it is provable by the fact that the restoration of the rhythm usually removes constipation.

The above suggestion as to the principal source of constipation is further confirmed by a variety of physiological considerations, some of which may here be stated.

The immunity of the lower animals from constipation affords a lesson as to the mechanical conditions for such immunity—conditions which easily prove curative, when properly supplied to human sufferers.

The anatomical conformation of animals is such that the horizontal trunk is supported at each end. The effect of locomotion, as a consequence of this position, is to produce a constant perpendicular oscillation at whatever rate of progress the animal makes. This motion causes the separate

contiguous parts of the digestive organs to glide upon each other at every step. At the same time there is distinct traction at the rectal extremity of the digestive canal. The mechanical effect of the motion is to prevent continuous or prolonged plications of the tube; the physiological effect is the incitation of the peristalic motion which is always required by the digestive organs.

This inevitable and spontaneous supply of motion in the digestive organs of the lower animals, shows its necessity, and the importance of maintaining in the human species an equivalent action of the same parts, to secure the same results. And in case of failure or insufficiency of organic rhythm, the suggestion of the supply by art of compensatory motion, is most natural as well as philosophical. The gliding of the peritoneal surfaces of contiguous parts of the digestive organs of the human kind is a necessity, and must be scrupulously maintained; when not by the ordinary avocations of life, then by means adapted directly to that end. It is this peritoneal gliding which maintains the peristalsis; urges forward the alimentary contents, and promotes the absorption of the digested products. It is a most important mechanical incident of nutrition.

In health, peristaltic action extends through, from the superior portion of the digestive tube to the rectum, and thus maintains its function. The rectal action therefore depends largely on the extension to that organ of the incitation to peristalsis in the digestive organs, by the peritoneal gliding produced by organic rhythm. The close sympathy of the superior with the inferior portion of the digestive tube is proved by the effect of injections, suppositories and like means used for the purpose of temporarily producing peristaltic incitation. As this recourse can never have the least effect on the *cause* of constipation, as above explained, it is plain that it has as little influence on its cure; for constipation is not identical with its conspicuous symp-

tom; that is, restrained movements of the bowels; but is closely affiliated with defective rhythm.

The application of the same physiological principles extends to the ordinary palliatives of constipation, under the form of laxatives, aperients, cathartics, purges, etc. These are means of inviting peristalsis, but limited to the digestive organs in their effect, and therefore cannot in the nature of things affect the real source of the difficulty. Moreover, the effect, whether mild or violent, does not extend beyond the period of incitation; after which the whole connected organs relapse into their previous inertia. Nothing worth considering has been gained. The influence of remedies of this class does not extend to development of power of the parts controlling the immediate symptom; much less do they afford the least aid in the restoration of the organic rhythm, this essential factor being constantly defective in chronic constipation.

The abnormal distention of the rectal pouch above adverted to easily affords a basis for other subordinate symptoms, distinct from constipation and piles. Among these may be mentioned ascarides or worms; also fissures of the anus; ulcerations of the interior surface of the rectal membrane; interior abscesses, which sometimes work their way to the exterior parts forming a fistula, this being a sinus or canal, having an exterior discharge. All these consequences are doubtless subordinate to the primary condition of local ill health, superinduced by loss of contractility from defect of natural incentives, ultimately referable to defective rhythm.

The principles herein set forth as to the nature of the fundamental defect in constipation and other rectal symptoms, places the means, not merely of temporary relief, but of absolute and permanent cure, in the possession of the patient himself. As it is in general a lesser degree of several similar consequences of the same cause, it follows that it should be remedied by the cultivation secured by the same means.

X.

Evolution of Mechanico-Therapeutics.

It is obvious that the mechanical principles embodied in normal physiology are ample to maintain in health the tissues forming the base of the abdominal wall and the interior parts in juxtaposition therewith. Morbid affections of this region are inseparably connected with defect of mechanico-physiological activities. The health of these parts rises and falls in degree, in the ratio of corresponding fluctuations in the organic rhythm, and its restoration may confidently be sought through the restoration of this rhythm, even in the absence of other remedies. The means for cultivating this rhythm, therefore, constitutes the true and practical therapeutics of the region thus suffering from its defects; a remedy of broad range of applicability and searching power—constituting a branch of therapeutics hitherto almost neglected.

The appropriateness of mechanico-therapeutics for affections of the different contents of the lower portion of the trunk and pelvis, is made evident by their topographical association; by their consequent exposure to the same mechanical influences, whether these tend to health or the contrary; by the fundamental nature of mechanico-physiological action which has been shown to dominate all these associated parts as a mechanical unit, without reference to their anatomical or their physiological peculiarities; and by the perfect agreement, indeed the unity of the remedy with both physiological and therapeutic needs.

The mechanico-physiological principles, whose therapeutic availability have in the preceding pages been set forth, present certain advantages which might be presumed to be exceedingly favorable to their universal adoption. A medical education is not essential to their being understood. They

may be practically verified by any one in his own person and behalf. Any incorrectness of statement as to remedial effects can be easily and quickly shown, so that no currency should be given to errors. All, whether scientific inquirers, cavillers, believers or misbelievers in the principles set forth, can thus satisfy themselves of their verity and utility by the same tests as are employed in actual therapeutic applications.

The above considerations are, in reality, disadvantages. As to the invalid, they remove him from his natural position of credulity and childlike dependence. His faith in powers outside himself and not under his control, rises in proportion to his disobedience to physical laws. Invalidism is, in a sense, a reversion to a more elementary condition, credulity supplying the place of knowledge. The invalid substitutes the subordinate and incidental, for ultimate causes. In the matter of remedies he is often best satisfied with the mysterious and unintelligible.

The medical prescriber labors under even greater disadvantages as respects the adoption of fundamental principles. A student of medicine is less an inquirer and searcher for truth than for established precedent—the conclusions sanctioned by time and incorporated into the lore of the profession. For a physician to pursue inquiries deemed irrelevant by his confrères, is to be denied the advantages of which he is heartily in pursuit—the fellowship and guidance of an honorable body whose favorable estimate is essential to his professional life. Current medical literature, a record of survivals from complex and often dangerous medication and operations, offers more mental food than he can well digest. It is only through the force of peculiar circumstances, which may not be of his own seeking, that the physician may be led into anomalous and special paths of inquiry.

The physician, besides, impliedly engages to *please* his patient, satisfying his mental, emotional and moral idiosyncrasies. He almost instinctively adjusts his processes and pur-

poses to that end. These are some of the reasons for the tardy popularity of fundamental principles in therapeutics.

The facts and principles which have been set forth relating to the etiology and therapeutics of affections incident to the basal region of the trunk are stated confidently, because as thoroughly proved as anything can be. They are the results of actual extended experimentation, not in any single aspect of the subjects to which they relate, but all, in almost endless variation. The reader may be interested to learn that it was but a slight event that suggested the direction and pursuit of this long series of experimental and searching labors, which led onward to the conclusions now made.

The event referred to is narrated in the author's book, "Health for Women," in sufficient detail. A man of some distinction, who had suffered for many years from prolapse of the rectum, applied for relief. The sphincter appeared to have little power to retain the intestine when reposited; and the irritation extended to the remainder of the digestive tube, and superinduced constant straining and often uncontrollable diarrhœa.

Such a case was particularly favorable for the demonstration of the capability of the mechanism of the organism, to draw upward and inward the extruded portion of the bowel, and to maintain the advantages thus secured. The recalcitrant segment of bowel had, for many years, been frequently and forcibly *pushed* inward and upward, in opposition to the sphincter, and against the persistent opposition of the vermicular motions of the abdominal portions of the intestines, but without the least curative advantage. This mode of palliation was almost constantly required.

The process substituted for pushing the bowel upward, was that of *pulling* upward the same part, by means of the mechanism of the organism; the force being supplied from the interior, instead of at the exterior or extruded part of the rectum.

The first trial was, in this case, perfectly successful—noth-

ing further could be desired. The proof of the retreat of the bowel was ocular and void of any questionable or deceptive element; the processes agreeable and not in the least painful; the result perfect and permanent, and in no sense transient or palliative. Auto-reposit by the new method was found to be perfectly practicable and easy, and the effect could be uninterruptedly maintained, without truss, pad, or exterior mechanical or other application. The remedial indications were thus fully provided for; nothing more was needed but such instructions in such self-applied processes as would become a safeguard against future possibilities.

The important facts in pathology and therapeutics that had now become demonstrated, were these:

Downward displacement of the contents of the inferior portion of the cavity of the trunk is not a disease merely local; any consequence of dislocation of anatomical parts cannot, therefore, be an independent affection. An affection thus caused and dependent must fluctuate in degree in proportion to fluctuations of its cause. The manifestation may be produced or removed by supplying or withdrawing its cause. The causative factor is therefore the essential one to be considered in a therapeutic light.

Another principle of equal importance was simultaneously demonstrated. The organism is endowed with functions purely mechanical; always in reserve for instant use; adapted to control the mechanical position of the organs mechanically associated in the pelvic region. It further became apparent that whatever function of these same parts is dependent on, or affected by mechanical position, is controllable in the same way. The illustrative case now referred to was afflicted with unmanageable diarrhœa, which instantly ceased with the restored position. A more common coincident is constipation, which is of course incurable without restoration of the mechanical difficulty; and so of all other subordinate symptoms.

In due time each of these and a multitude of other inferences became verified by actual cases restored; and it was found that, so far from being a possibly exceptional case, it was difficult or impossible to find exceptions to the principle.

Weakly children, liable to rectal prolapse, were found particularly amenable to the processes adopted, even in nurses' arms. Strangulation and proctitis do not afford exceptional cases; in these cases ordinary sedatives are a convenience, if the limit of their aid be understood, and that the real difficulty is only met by another form of remedy. Hernia was proved practically to belong so the same order of affections, and to be easily amenable to similar internal mechanical methods of cure.

The convictions established by positive demonstration, corroborated by the physical facts of physiology and by the hard facts of therapeutic success, cannot be weakened by opposing theoretic speculations. The power and the sufficiency of mechanico-therapeutics are too readily shown to permit of dispute. The conclusion became irresistible that *all* the organs, topographically related in male and female, must be obedient to the control of the same mechanism.

The transition from the rectum and affections of the hernial region to the contents of the female pelvis was inevitable, in both etiology and therapeutics. The very close mechanical relationship of the parts rendered that of therapeutics a justifiable inference. But since the deviation from health of the contents of the pelvis of the female, appertains both to the anatomical parts and to special functions intimately interwoven with the whole existence; and since the morbid conditions acquired through the same source become differentiated to an extraordinary degree by morbid development, to which the pelvic parts belonging to the male are not liable; a critical survey of the whole subject appears to be necessary to render the sovereignty of mechanico-therapeutics intelligible.

Anatomically, the contents of the female pelvis form the inferior boundary of the abdomen, upon which the contents of the latter, when otherwise unsupported, necessarily rest. It follows that both pelvic contents and hernial tissues bear the same mechanical relations to the parts above, and therefore submit to the same mechanical laws, whether favorable or otherwise.

The different effects of the morbid cause, hereinbefore sufficiently explained, becomes due to the following differences incident to sex. The narrower superior opening of the male pelvis would allow a proportionately larger area of the base of the abdominal wall to become exposed to the unsustained and unmitigated compression of the overlying abdominal contents; and the proportionately increased exposure of the wall to one of the consequences of compression, or herina.

So, also, the broader opening of the female pelvis affords a sort of guide, directing pelvis-ward the unsupported abdominal contents. A much larger surface of the pelvic boundary is thus exposed to these mechanical effects in women than in men. In women, the mechanical effects are divided among a multitude of distinct parts, in accordance with the peculiarities of their mechanical exposure to the downward operating force.

While in men, the parts liable to suffer from unantagonized gravitation and other causes co-operating with it, are limited to the rectum and the hernial border of the abdomen; in women, not only are the organs increased in number, in size, in exposure, but also in relative functional importance; and pathologically, by the vast extent to which differentiation is possible, and the ultimate consequences which flow from this fact.

It is these latter circumstances which, by disguising the true etiology, have been the puzzle and the stumbling-block

of the gynecologist unpossessed of the requisite therapeutic facts for his guidance.

Besides the rectum, whose function is comparatively insignificant, exercising but slight influence on the organic whole, and whose pathological differentiations are perfectly simple and intelligible, the female pelvis contains the generative intestine. This consists of the vagina, the uterus, the fallopian tubes, the ovaries, the ligaments, a very large proportion of connective tissue, and an immense reticulation of blood-vessels, normally subject to extremes of dilatation and contraction. This latter fact carries with it in nature adequate physiological provisions for the *control* of the contents of these vessels. This control involves the disposal at all times, and also at periodical intervals of the contents of a reservoir of blood destined either for nutritive support, or for some morbid alternative, according to the more or less perfect operation of the provision referred to.

There therefore appear abundant reasons in the anatomy of the female, and still more abundant in the physiology of the organs occupying the pelvis, why the same mechanical influence in its varied gradations, must produce a variety of effects in women, to which men are not exposed; also why these effects are so modified by concurrent circumstances and intermediate forces as to completely disguise their origin to one who confines his observations to the local products, and to the sensorial phenomena and nervous complications connected therewith. Even adepts are quite led astray by the sensorial phenomena, when they fail to recognize the physical defects in which these originate. The etiological facts and principles being neglected, it is no wonder that remedial prescriptions degenerate into weak apologies for local support that is never in reality supplied; and to a still more feeble pandering to the sensibilities, and to the irritable emotional activities which are incidental to this class of affections, instead of addressing the sources of these, and in

a robust manner securing positive and radically curative effects. It is readily seen that the practical success of mechanico-therapeutics in affections of the contents of the pelvis, including those of the hernial border, is based on the practical recognition of unity of cause; and that this cause consists of the mechanical defects of dominating functions and parts. The more thoroughly to show the practical unity of the effects of defective sustentation, however differing these may superficially appear as relates to location, form, extent and degree of development, the more usual varieties will now be considered by way of comparison:

1. The inferior boundary of the abdomen and the superior boundary of the pelvis are in an imaginary plane, of which the hernial border of the abdomen is an extension outward. It is therefore clear that the irregular convolutions of the abdominal contents are in direct contact with the superior surface of the pelvic organs, exactly as they also are in contact with the inner face of the hernial tissues. The projecting loops and segments of both are applied to and engage in the respective anfractuosities of either, as a wedge enters a crevice. Any weakness and interior depression of the inner face of the hernial tissues, invites precisely the same wedge-like relation. These mechanical relations of parts being the same, it follows that the mechanical consequences must also be the same. Cleavage of separable parts, whether of abdominal walls or of the organs of the pelvis, is inevitable, and in proportion to the unrestrained gravitating force. Local mechanical opposition, whether exterior to the abdominal wall, or below the pelvic contents, produces not the least effect on the downward force. This force has two main sources: one is gravitation acting independent of physiological restraints; the other is perverted action of muscles of the trunk from defective use and training.

It therefore appears that the condition of the pelvic contents is intimately related to that of the contents of the base

of the abdomen, both being dependent on the degrees of perfection attained by dominating forces having physiological sources. The partial or complete suspension of these causes allows extrusion of the rectum through the sphincter, or loop of intestine through a weak point of exterior wall. When the subject is female, the mechanical cause is more forcibly directed to the pelvis, urging out of place and out of shape its contents; the intrusion being a conceded fact as relates to the digestive organs, but an inconspicuous one as relates to the displaced generative intestine; this thenceforward becomes the object of untiring gynæcological endeavor.

The form assumed by the effect is, of course, the product of subordinate causes, and therapeutically demands but subordinate attention; and even this is unessential to the ultimate result of the appropriate kind of medical treatment.

2. The identity of source of the different effects known as protrusion, when applied to the rectum, and as displacements when the female generative organs become their principal seat, and which are the necessary concomitants of intrusion, is further shown by the remedies ordinarily employed. The truss pad for hernia, the T bandage for rectal prolapse, correspond to that multiform device generally known as the pessary. These devices all have the same mechanical purpose of obstructing the outward passage of viscera where this appears to be threatened. Each of these are applied exteriorly to the obtrusive manifestation; each supplies obstacles, not to the cause, but to its effects; each is employed in utter disregard of the cause.

The most ardent advocates of either of these remedial methods do not pretend that these instruments, in any of their varieties of shape and modes of use, or by the most dexterous management, are capable of producing the least effect in the way of supplying physiological sustentation. They cannot diminish in the least degree the superincumbent weight, nor the effect of this weight at some point where it is

due, and where the weight becomes mischievous. These appliances all equally discourage the rhythmic motions which supply sustentation; and afford no auxiliary to, or substitute for, the physiological action by which alone the health and position of these parts are determined.

The identity of source of these varied affections is therefore shown by the identity of the misconceptions which prevail in reference thereto, and by the similarity of the pathological consequences resulting from misguided attempts at cure.

3. The diversities of form incidental to both hernial, rectal, and pelvic affections, are further evidence of community of origin. A protrusion may occur at a variety of points along the lower border of the abdomen. The actual location of the manifestation, whatever the variety of form, evidently depends on subordinate factors, and is not, in fact, due to any peculiarity of the downward urging force, but to the obstacles which fail to oppose, but serve to guide the effect, whether this be protrusion or intrusion. These circumstances, so far from being causes, are therefore only subordinate conditions, and could have no influence in the absence of the primary fact heretofore explained.

This relation of primary and secondary or guiding factors, is further shown in the facts already developed in regard to the therapeutics of each of these classes of affections. Supports have no effect beyond the point also reached by subordinate conditions; they turn or check the descending viscera only at certain progressed stages of downward career, and not at the incipient and curative stage; while the sustentation afforded by restored power quite supersedes these supposed remedial needs.

4. The principles now developed in regard to true support of the abdominal and pelvic viscera, and of the nature of the mechanism which never fails to be at fault, whenever the hernial tissues and the pelvic contents afford evidence, physical or rational, of defective support, are further confirmed by

certain other mechanico-physiological facts pertaining to the pelvic region.

If it be true, as therapeutists so frequently assume, that visceral gravitation is opposed, naturally, and properly, and adequately, by the parts immediately beneath the gravitating mass, the fact should be patent at the perineal outlets of the body. On this assumption, the whole overlying mass constantly tends toward these outlets, restrained only by the sphincters; an assumption contradicted by the universal experience of the healthy. On the assumption, also, muscular action, especially such as contracts the circumference of the trunk, as lifting, bending and even evacuating the bladder and bowels, would be attended by the peril at least of dislocating the viscera; this is opposed by the facts of experience. On the same assumption, also, the perineal body should have great natural resisting power on account of its exposure to the assailment of the conjoined forces acting downward. On the contrary, this organ is almost devoid of muscle or of any resisting power whatever; but, by its loose construction of connective tissue, is better adapted to yielding than to resisting. It is entirely powerless to prevent the class of effects implied by the assumption named.

The above considerations prove, as far as anything can be proved by the argument from design, that nature's intention is to supply sustentation and support from above, and not from below, and that medical and surgical interference pointing to the contrary are misconceived in theory and futile in practice.

5. The ultimate morbid possibilities reached by extrusion under the names of hernia, and of intrusion under a variety of names, still further prove the identity of cause. The possible result of hernial and of rectal protrusion is strangulation. The part dies in consequence of compression, which prevents the blood from circulating in the constricted part, depriving it of nutrition, that is, both supply and waste of material.

Local disease of the pelvic organs presents similar results, modified as to extent. The comparatively large size of the pelvis and the extent of its connected contents, together with the vast amount of reticulation of its nutritive vessels, preclude the possibility of their complete obstruction and consequent loss of vitality. Instead of this, the consequences of embarrassed circulation arise in the form of diminished vital power, and accumulation of substance over which there is diminished control, both vital and vito-mechanical. The capillaries become distended with sluggish blood currents. This is hyperæmia, which, with its immediate results, is gynæcologically known by a multitude of other names, according to the location of the point of greatest excess of the effect described. The analogy between the effects of partial and complete obstruction of blood currents, whether in a hernia, a prolapsed rectum, the compressed vessels of the female pelvis, or a finger of the right hand, is too obvious to require comment. The fact of obstruction, in some degree produced by compression, and of its consequences, varying with the nature and location of the organ, remains. The therapeutic suggestion is too plain to require statement.

6. The common origin of the group of affections under consideration is further shown in the nature of the ultimate causes. This is such as to include all varieties of forms, however diverse their final development.

The cause of dislocation and depression, the evidences of which become manifest in various ways, has been shown to consist in diminution, not unfrequently in entire suspension, of the extension to the pelvis and its vicinity of the never-ceasing rhythm necessary to the health of these parts, and necessary also to their proper topographical relations. This motion mechanically sustains; and if need be, draws upward with irresistible power, the contents of the pelvis and the adjacent abdominal contents.

Restricted extent of rhythm is the proximate cause of loss

of sustentation. The ultimate cause is loss of power of the muscles which normally engage in the rhythm. This loss depends on causes easily made intelligible, and therefore subject to correction through the understanding. The cause may be briefly stated as the employment of nutrition for the support of other activities, whereby it is withdrawn from the indispensable organic needs. The adequate support of the rhythmic and involuntary mechanism is thus rendered difficult or impossible.

There can be no doubt but wholesome activities secure an equal distribution of nutritive support to all the functions, according to the respective needs. Prolonged special activities of any part, the limbs, the head, the nervous system, in any particular physiological department, superinduce relative excess of nutritive as well as functional support, entirely incompatible with the requirements of the neglected portions of the organism. These are allowed to languish; the muscles become lax and feeble, the nerves torpid or morbidly irritable, diffusing an unwholesome influence.

This is just what happens in case of women suffering from affections pertaining to the contents of the pelvis. They flee to the physician to be relieved of the evidences of defective sustentation. But these are also evidences of defective use of parts on which the health and the position of the offending organs entirely depend; and there follows defective power of the muscles which are employed, involuntarily, night and day, in the rhythmic motions which have now become diminished in extent and changed in direction. The muscles which perform the office have been insufficiently dominated by the volitions. Their power can increase only by use. We are largely the architects of our own physiological destiny. We take the consequences of our acts and of our non-acts equally, whether advised or ignorant thereof.

Women's energies are largely employed in other directions than those which even incidentally cultivate and maintain

those portions of the body which normally engage in physiological rhythm. In some cases it is the cerebral activity which absorbs nutritive support to the degree of starving the abdominal muscles, so the motions of respiration fail to descend, but stop at the ribs. In others it is the habitual excess of the emotions that causes the same damage. In others, including probably the majority, the duties demanded by the social habits of our civilization call into use but few of the trunk muscles; the limbs may be disproportionately employed to the detriment of the indispensable organic rhythm.

In proportion as general muscular power diminishes, the respiratory rhythm is restricted to the chest, and fails to penetrate the mass of digestive organs, for whose advantage the motion is equally necessary.

The sad consequences of defective sustentation, in all their subordinate and derivative forms, are not at all difficult of prevention and cure. But the remedy must be applied to the causative factor rather than to the consequences.

XI.

Pelvic Hyperæmia; Its Sources, Consequences, and Control.

The fluid constituents of the pelvic contents are a leading consideration in the therapeutics of the pelvic region. Many of the affections pertaining thereto are characterized by very evident excess of fluids and a tendency for them to escape, as in case of piles, and other hæmorrhages, local catarrhs, abscesses, fistulas, leucorrhœas, etc. Still further is the same general fact denoted by the retention of fluids, either in some primary form, as congestion, common to these parts; or some secondary consequence, or outgrowth, as tumors and other manifestations, whose occurrence is impossible without a prolonged detention of local fluids.

The same general fact is again denoted by the nature and intention of the remedies usually employed to mitigate or cure the sufferings associated with the pelvic region. These are such measures as are adapted to diminish the excess of local fluids. The numerous devices employed for this purpose are well known; individual physicians have their special, favorite and preferable remedies, whose purposes are quite similar.

The peculiar aptitude of the pelvic contents, especially of women, to hyperæmia, is an unquestioned fact. How to dispose of the excess of fluids whose presence in the pelvis or some of its parts is manifested in such protean and troublesome forms, is the ever recurring question in pelvic therapeutics. What is the provision, or the compensation of nature with reference to this tendency, and is it available for therapeutic ends? is the question of absorbing interest?

In describing the anatomical and physiological aptitude of the pelvis to hyperæmia Dr. T. A. Emmet says: "We must appreciate that in no other part of the body have we such a matted net-work of blood-vessels in the same space. In consequence of the erectile character of all the tissues these vessels become varicose from any continued obstruction to their circulation, and have an almost incredible venous capacity. As a stream will saturate the ground and lose itself in a marsh, so will the circulation through the pelvic cellular tissue become in disease equally sluggish. . . . . In this over-distended condition of the veins the balance is lost, and they are no longer able to return to the general circulation, the same quantity of blood received by them from the arterial capillaries."

The above extract affords a vivid picture of the essential condition preliminary to pelvic hyperæmia, whatever further development it may be allowed to assume; it is the point of divergence, whence proceed the differentiated forms of local

disease, known to physicians by names characterizing appearances, rather than etiological facts. It is thus that names often mask the origin and real nature of diseases, otherwise easily intelligible. In regard to the excess of fluids of the pelvis, there can be but one source; this is defective return of the venous circulation; this is the causative condition and the constant concomitant.

It follows that the pathology and the therapeutics of the pelvic contents, so far as these relate to its fluids, can hardly be adequately understood, without carefully tracing the uses and destiny of this most abundant and at the same time most mobile of its components. Fluids are the real medium of vital changes, whether these be healthful or morbid; and a true pathology therefore exposes the embarrassments and interruptions to which the fluids are liable; and the physical as well as the vital laws to which they are subject. This being done, the pathology of the pelvic region is to a large degree mastered. The physician is put in possession of *direct* therapeutic methods, largely superseding the indirect methods with which a restricted understanding of the subject compels him to be content. Minor, and often major gynecology, under this enlarged view becomes simple and intelligible.

The extent of the anatomical provision of the female pelvis to receive and to retain blood, in its great wealth of capillary net-work, having erectile and extensible properties exclusively its own, has been noted. This provision is based on physiological requirements, and is intimately and indispensably connected with the perpetuity of the race. Without doubt, it is the best provision, all things considered, that nature could supply; and one also that is no more liable to disease, the penalty consequent upon abuse or neglect, than any arrangement that might have been substituted, or even conceived. This physical capacity of the pelvis, and of its separate and distinct anatomical parts to receive blood, has, as is well known, its healthful perturba-

tion, its accessions and recessions, its flux and reflux. At one time this capillary mass, including several distinct organs, is completely distended ; following this, at a suitable interval, it becomes as completely collapsed. The elasticity which constantly measures these extremes between extension and contraction is periodical, complete and recurrent, like the reaction of a well-tempered spring.

The turning point which marks the limit between health and incipient local disease, is the extension of the local capillary dilatation into and over the contractile period. This conclusion is reached from considerations relating to the intrinsic nature of the physiological facts involved ; from general therapeutic endeavor and practice ; and particularly from the effect of the remedial measures to be hereafter shown as more powerfully and searchingly adapted to that end.

Gynecologists, admitting the general principle above stated, refer the fact of abnormal distention of pelvic tissues to a multitude of causes, enumerated in standard works on this subject. A critical analysis of the causes assigned, however, shows them to be secondary, and not ultimate. This is seen by the evident fact that innumerable instances have existed, and still exist, of exposure to the causes assigned, without morbid consequences, either functional or organic. This proves that in each instance of the kind, there has been in action some inconspicuous but entirely effective opposing power ; the same power, in fact, that is operative as preventive of hyperæmia under ordinary circumstances. It also further proves the absence, or at least, the defective operation of such power or agency in cases when disease follows the so-called cause or exposure. From this fact arises the suggestion of the possible discovery of such agency, for the purpose of increasing its sway and efficacy in removing the defects on which local disease is dependent. This power, force or agency, is a reality, and the reliable and effective

means of removing chronic pelvic hyperæmia, whatever the complications under which it appears, and at whatever stage of progress it may have arrived.

In the preceding chapter it was shown that the organs of the pelvis, as the rectum, uterus, and the connected parts, are exposed to mechanical dislodgment from their physiological position in proportion to the curtailment of the natural or physiological restraining force upon which sustentation depends. It was also shown that this principle is proved by simply supplying this agency, when restitution of position immediately occurs.

Now, the same power or agency, proceeding from the same sources, manifested through the same channels, by the same mechanism as has been pointed out as the antagonist of gravitation of the pelvic contents in mass, acts with even greater constancy, certainty and energy upon all fluid constituents of the pelvic capillaries and vessels; and through these on the intervascular fluids of the whole pelvic region. The superior mobility of fluid over solids, conduces to this increased effect as relates to the fluid portion of the pelvic contents. Fluids yield to any sufficient power; they do not oppose ponderable masses, but only the minutest and separable atoms of matter. While the solid matter is the fixed constituent of the organs, the fluids depend momentarily on the efficacy of the forces controlling them. The physiological integrity of the organs depends on that of the fluids, and when we are acquainted with nature's mode of disposing of these, we have the key to the pathological situation.

Pathology is, in general, but a deviation, usually a lesser degree of physiology; and the facts pertaining to the latter are first and particularly to be noted; and the same principles are applicable to the fluid as to solid forms of matter.

It has been shown that the organic rhythm extends in health, downward; it thoroughly pervades the contents of

both the abdomen and the pelvis. The continuity of the cavity renders this mechanical effect indivisible, as relates to the whole contents of the cavity.

The immense lifting effect, easily procurable by the various degrees of exaggeration of the action of the mechanism connected with rhythm, has been fully represented in its proper connection. The slightest observation of the operation of the physiological mechanism having this end in view, shows clearly and above all cavil that the dominance of the mechanico-physiological apparatus is as pronounced in disease as in health. There is a rhythmic perturbation, which has been shown to extend from the brain to the pelvic contents at every healthful respiratory act. This, as respects the pelvis, is insufficient in degree, in pathological conditions of these parts, whether the form of pathology be incipient and functional, or advanced and organic. In other words, pathology, in its wider sense, in its application to the pelvis, involves mechanico-physiological facts and principles.

The fluids are in incessant mechanical change. Local nutrition demands equal facility of inflow and outflow. The mobility of fluids, under mechanical impulse, is immeasurably greater than that of solids, for these yield in their minutest parts, while solids require sufficient force to overcome the inertia of masses. The abatement of these impelling causes therefore produces inertia that pervades the solid parts. The fluids of the body have little or no control over their destiny. They have little inherent power of locomotion; they are the sport and the victim of the circumstances which control them. It is mainly exterior conditions which either supply or withhold impulsion.

Blood reaches the pelvis for the nutritive support of its organs, as it does all other parts, through the arterial channels from the heart, under the incentives of local demand. The local provision, as has been shown, is extraordinary in women, to comply with corresponding possible needs.

Such abundant provision for probable local pelvic requirements involves equivalent provisions for outflow of fluids. During all the perturbations to which the living being is subject, the inflow and outflow require to be in a state of equipoise.

One of these provisions is local waste, which is well known to be extraordinary in the human female. The monthly flow is a necessary part of the uses of the sexual provision. The capillary reticulations of the pelvic organs are normally adapted to extreme perturbations; now greatly distended, and again contracted to an extreme. The periodicity of these perturbations is the marked feature. The fecundating power is maintained through this appointed means.

The other principal agency for removing that portion of the blood from the pelvis that has become venous, is identical with that which supplies sustentation, viz., the mechanical. The column of blood is *lifted* in its proper venous channels coincidently with the same effect experienced by solid pelvic parts. The mechanism of the circulation brings new supplies to these vessels for every rhythmic action. This action, therefore, secures uninterrupted outflow from the reservoir formed by the capillary reticulations with which the pelvis is so abundantly provided.

The mechanism devoted to this purpose embraces the whole trunk; and emergencies frequently requires its fullest resources. When the force of all the muscles is called into full operation, it is resolved into an hydraulic engine of extraordinary power. The efficiency of this mechanical device is proven by its capacity to move upward and to sustain against gravitation the whole mass of interior digestive organs and appendages, with whatever additional resistance may be imposed by the emergencies of position and of avocation. This mechanism acts incessantly, no less in sleeping than in waking; is automatic, and independent of care, anxiety, or the will. Its location is immediately *above* the work to which it is

devoted; in practice, found to be the most suitable mechanical arrangement for a pumping machine. This mechanism exists in every animal and demonstrates its power and efficacy in the health with which its action is intimately connected. This is the ordinary agency for the constant removal of venous blood from the pelvis. Hyperæmia is necessarily present or imminent whenever the provision is inefficient. We can now see the absolute and unqualified necessity for its unintermitting operation, since it is by its continuous though silent power that the periodical hyperæmia incident to the generative intestine of women is prevented from lapsing into permanency.

And the evidences are direct and unequivocal that, when permanent morbid hyperæmia supervenes, it is always accompanied by an abatement of the extension of the respiratory rhythm to the affected parts.

The enormous capacity of this mechanism for extending its power and scope under emergencies, has been shown in a preceding chapter. This is done by temporarily changing the control of the action of the mechanism from automatism to design. Under such prescribed circumstances it becomes an unparalleled remedial power, capable of removing the prolonged hyperæmia incident to chronic disease of the pelvic organs, and of maintaining automatic permanency. Its work may, through persistent cultivation, exceed the bounds of health; it may even cause suspension of the natural periodic hyperæmia, and may be applied to this use if, from a medical point of view, this effect becomes desirable.

The correctness of the above statements, showing the design of the mechanism for obviating, and when necessary, for removing, pelvic hyperæmia, and its complete adequacy to produce this effect in whatever degree, is further shown by analogy. The pelvis does not furnish a unique situation. Another not less important portion of the organism clearly depends on the same cause to secure similar effects, has been

referred to in a preceding chapter, the substance of which may be repeated here.

Like the pelvis, the head is securely enclosed by inflexible bone. Like the pelvis, no exterior muscles are capable of compressing its vessels to aid the venous blood-flow, as is the case with other portions of the body. The head has no interior muscles to contribute to the same effect. The interior muscles of the pelvis have no power or adaptation to control the blood outside of their own substance; the remainder is amenable to the same control as that of the head; or, when that fails, as in chronic pelvic affections, to none at all.

It is therefore clear that any form of pelvic disease growing out of hyperæmia, or having hyperæmia as its initial stage, is always imminent whenever the mechanico-physiological processes designed and adapted by nature to complete the circulation of blood in the pelvic region, are in abeyance. All inadequacy at this point is immediately reported in the form of local symptoms.

The primary form of the consequences of imperfect return of the venous blood of the pelvic region, consists in distention of the local capillary vessels, thinning of their walls, diminution and stagnation of the capillary currents, effusion, and loss of contractile power of some portion of the enormous capillary net-work distributed to the pelvic organs. The cause of pelvic hyperæmia, and the primary consequences of this cause being understood, the special derivative forms of morbid phenomena which follow are more easily comprehended. It is these latter only, which afford concern to the patient, and from which relief is demanded. There is usually an innocent and refreshing unconsciousness of the existence even, of a primary and causative stage of pelvic affections on the part of the patient. Even physicians are inclined to devote first attention to subordinate and derivative effects, sometimes only to incidental symptoms, to the neglect of the causes from which their power to annoy is derived.

It may be well for the student of pelvic pathology to have at least a theoretic idea or plan of the succession of the progressive stages of morbid pelvic phenomena. This may in some degree aid the comprehension of individual cases in practice. The difficulty in accurately predicting the kind of pelvic affection which will arise in a given case, is that something which is imposed by individuality of temperament and constitution, the effect of whose combination with the primary and essential factor is beyond the power of estimating. But to regard acknowledged facts of pathology as hypothetical stages of morbid development, will be of use in fixing the primary principles and their leading therapeutic importance.

1. First in order are defective organic rhythm; defective sustentation; defective return circulation dominated by organic rhythm; defective muscular nutrition.

2. Hyperæmia; distention of capillaries pervading the whole pelvis or some portion thereof, as the uterus, the ovaries, the fallopian tubes, or segments of these separate parts, as the uterine neck or fundus, anterior or posterior, its body similarly in distinct portions; and so of the remainder of the generative intestine. Resulting from and indicative of this condition are:

(*a*) Excessive periodical discharges. Unperiodical discharges.

(*b*) Alternating with the above is increase of weight and change of position of the pelvic organs. Constitutional evidences of weakness.

3. Advanced stages of hyperæmia; loss of contractile power of capillary walls; cellulitis; local chronic inflammation of some portion of the generative intestine.

(*a*) More abundant discharges, periodical and unperiodical, with morbid qualities of both; more frequent periodicity; ulceration of os.

(*b*) Alternating with the above are the hyperplasiæ.

(*c*) Great nervous complications, manifested in cerebral and spinal suffering; rhythm below the diaphragm very feeble.

4. Increase of all symptoms, local and general; neoplasms; hardness and weight of some portion of the uterus, or the ovaries increased; periodicity nearly abolished.

(*a*) Irritability and hypernutrition of nerve centres, cerebral and spinal, and abolition of muscular power; rhythm below the diaphragm abolished.

The above-noted manifestations of pelvic disease are more correctly understood as being varieties of essentially the same thing, in different stages of development. They have no independent existence, but are forced upon the pelvic organs by dominating conditions, chiefly those relating to sustentation, or what is practically the same, the defective return of the venous circulation, which at this portion of the organism depends upon the same cause. Hyperæmia is the initial stage; other manifestations are outgrowths and variations derived therefrom, providing the requisite time is afforded.

Although these variations and diversifications exist without end, from causes relating to the individual, such as temperament, inheritance, nervous peculiarities, social position, etc., yet the different expressions by no means argue the necessity for different remedies, because all alike are subordinate and dependent.

The reason may now be more forcibly understood why invalids with pelvic affections receive local remedial attentions almost without limit. These afflictions practically appear to be perennial, in spite of the most assiduous local medication. The reason lies in the simple fact that only palliative and not radical remedies are employed; these are constantly addressed to the effects mentioned, which, however completely repressed, as constantly reappear, the natural outflow from the same inexhaustible fountain. The fundamental factor of the disease remains untouched. This

does not reside in the pelvis, but in parts quite above and far beyond the possible reach of the remedies employed. The consequences located in the pelvis may suffer temporary check, but while the causes are ignored there is constant reproduction of the effect, whatever new form it may assume.

Remedial measures of necessity correspond with physiological possibilities. Remedies imply channels and modes of activity, and their force and value are limited by these, rather than by their inherent or intrinsic power. Remedies resemble legal contracts, which have no binding force till subscribed to by all the parties.

It has been shown that nature provides two ways of removing excess of fluids from the pelvis: the periodic, and the rhythmic and constant. Now, these local diseases, in an unlimited, unenumerated variety, the secondary consequences of defective onflow and outflow, are easily mitigated by the unperiodical outflow, which constitutes leucorrhœal effusion. Other morbid alternatives easily become the pathological equivalents of leucorrhœal losses; for morbid pelvic phenomena are correlatives of each other—what must occur in some form or other, under the circumstances.

Two remedial resources are therefore plainly open. One is that of restoring the physiological power necessary for the control of the pelvic venous circulation. This is health. The other is to *imitate* nature in securing by art an *un*periodic flow, outward, to mitigate the pelvic hyperæmia. The onward flow of blood in the capillaries is doubtless temporarily aided by the impulse to contraction of their walls, derived from a great variety of local irritants; while a local leucorrhœal outflow is readily superinduced by the same class of remedies. The alternative principle is seized upon by the gynecologist, to the neglect of nature's positive mechanism. The accessible parts of the female generative intestine are therefore habitually belabored and tor-

tured in consequence of faults which really exist somewhere else, and which demand an altogether different remedy.

The benefactions of the grateful patient are evoked by seeming as well as by real benefits. Relief, however temporary, is felt to be a boon; inquiries as to its nature and permanency are not pertinent. Knowledge, coming through individual experience, comes too slowly for personal advantage. If the facts of experience could be available in time, little toleration would be given to the process of driving local hyperæmia from point to point, and allowing the average essential morbid condition to remain unchanged.

The nature of the case as it has been herein presented, admits of but one actual remedy. This consists of such measures as are capable of improving the power and extent of the mechanico-physiological action, through defect of which the consequences above detailed have become possible. This form of remedy, unlike all others proposed and employed, cuts off disease at its source; it therefore renders the maintenance of the derivative consequences of local hyperæmia, as well as the morbid positions of the pelvic organs, impossible.

The author will be pardoned an expression of gratification at the many evidences that the medical profession, or at least the nobler portion of it, is gradually assuming ground and accepting principles which he has for many years practically advocated. The loss of faith in the radical efficacy of the usual local remedies appears to precede, by a goodly distance, a perception of verity of the well-proved physiological form of remedy herein set forth. One of these evidences, contained in a recent number of the *Medical Journal*, by the editor, is appropriately quoted.

In a recent lecture before the New York Clinical Society, Dr. Frank P. Foster, speaking of the necessity of remedying pelvic affections through their causes rather than the effects, says: "So far as my own experience goes, I have met with

far more success by following this course, than by seeking the more obvious derangements, whether versions, flexions, hæmorrhages, discharges, stenosis, or any of the other conditions that are usually the direct source of complaint. If I stood altogether alone in these views I should hesitate to put them forward as of any importance, but I may be permitted to say, that for several years past Dr. Emmet has virtually given up intra-uterine medication in the treatment of endometritis; operations designed to open and enlarge the uterine canal are falling into disuse; the flexion theory of dysmenorrhœa is drawing to its downfall; and it is beginning to be felt that the curette is not all-powerful."

"But it is not alone the useless from which these considerations should warn us to desist; some of the therapeutic measures that have been much resorted to are injurious, especially when there is a tendency for the slumbering inflammation of the serous and cellular tissues of the pelvis to break out into an acute affection. I will mention only that one of them which is probably considered by many the one least likely to cause trouble—the operation of replacing the uterus by means of an instrument. I doubt if there are many who will agree with me in the statement that this procedure is unwarrantable under all circumstances, but that is my firm conviction. The leverage afforded by an instrument like a sound, passed into the uterus, to a certain extent unguided and unrestrained by the sense of touch, is certainly capable of doing much damage. * * * * There seems to be a mania for instrumental interference among those whose knowledge of the pathology and diagnosis of pelvic diseases is very limited. It is to be hoped that this state of things will pass away when gynecology takes its place on the plane reached by the other practical branches of medicine."

Many conflicting opinions have had their successive reign in the medical world within one's memory, as to the real nature and source of female pelvic affections. The essential

unsoundness of most, if not all of these, is proved by their want of agreement; and by each being partly or wholly displaced by some other which seems entitled to become in turn a sort of medical reigning style. This statement is substantiated by enumerating some of the conceptions which have prevailed, and are prevailing, and appear to afford the basis for special local remedies.

One of these is the idea that prolapse, inclination and flexion of the uterus, is the cause of all local pain and inconvenience, in which the whole system is said more or less to participate. The source of this idea is by no means confined to those who reap advantages from the sale of contrivances intended to raise and rectify the position of the uterus. Supporters and pessaries have had a long reign, but as shown by the preceding quotation, their irrelevancy to the condition is becoming better understood.

At one period the cause of offence was satisfactorily accounted for in the mind of the average physician on the theory of local ulceration. One is likely to find what he is intently searching for, since the process excludes as well as includes; and it therefore came to pass that the amount of ulceration of the uterine os became something like an epidemic. Greater refinement of diagnosis extended the affection to the cervical canal; and finally the whole uterine cavity came to be treated as though it were a source of some self-propagating malady, removable only by local medication. A further phase of diagnostic ideas was that of restricted local inflammation, in which the special locality of the affection was finely differentiated with reference to therapeutic ends. Thus we have anterior and posterior cervicitis, metritis affecting the body, fundus and the lateral divisions of the uterus. To these are added cellulitis, ovaritis, salpingitis, etc. These latter relate to the more obscure and inaccessible parts of the pelvic cavity, protected by location from visual and tactile observation, as well as from direct local medica-

tion. It follows that any departure from health hypothetically attributed to these parts, cannot be easily gainsaid. The removal of these important organs by dangerous cutting surgical operations to remove special symptoms attributed to them, has of late become a special feature of gynecology. This recourse, in the light afforded by the preceding pages, is the climax of the errors arising from the idea of removing effects instead of their causes. The absurdity would be paralleled by excising an external member for faults having their seat at a distance from the locality of manifestation. The grounds of the absurdity will be more clearly shown in Part III. of this work, to which the reader is referred.

XII.

Principles Governing the Remedial Use of Physical Processes.

A "Movement," or process having a remedial intent, may be a volitional act, prescribed and executed with reference to the specific ends it may be adapted to secure; or it may be motion communicated to the organism or some of its parts from some source of power exterior to it; or it may be of mixed character, and only moderately involving the will of the recipient.

The effects depend on the order, time, and other circumstances accompanying the processes as well as upon their special form. If the processes are promiscuous, no definite, certainly no curative, results may be expected. The effects then partake of the nature of exercises, and may be hygienic, but in no sense remedial. If misdirected, the weak parts may be made weaker, the inflamed parts more inflamed, the sensitive parts more sensitive, and any pre-existing affection becomes aggravated, and its curability seriously compro-

mised. If intelligently applied, and in correct order, not only will undue effects be obviated; but the general and the special morbid tendencies being reversed, become wholesome and curative. Under properly prescribed and applied processes, weak parts are more abundantly supplied with nutritive support, and the conditions for its appropriation are perfected. The nutritive inertia of parts and members suffering from the consequences of hyperæmia and mal-nutrition in any of its advanced stages, becomes quickened and perfected; the surplus material gathering about such locations is removed, and healthy functions resumed. Nutritive support is easily directed to or from any part, organ or function, as its medical need may indicate. That department of the vital apparatus most essential for the development of power, the eliminative department, which depends on the chemical act of oxidation, is increased and gradually raised to the normal degree.

The effects initiated by physical processes properly adjusted to the needs of the invalid, are rendered permanent by judicious repetition. By this means the incentive and its effect, become automatic as in health. In this respect the advantages arising from movement processes contrast strongly with the effects of incentives to physiological action afforded by other means, as by drugs however well selected, whenever the affection is a chronic one. For whereas specialized processes of motion contribute to, and ultimate in permanent development of the organs, little effect of this kind is expected of other means of inciting physiological action.

Chronic disease, however manifested, is naturally associated with imperfect, ill-timed and improper use of the physiological powers. Therapeutics impliedly proposes to substitute a new distribution of nutritive support, by an improved use of the powers requiring such support. Such a change at once corrects the old distribution and morbid use of

nutrition. The imperfect processes are gradually replaced by those approximating perfection by progressive stages. Such advances require repetitions of the process which invite the improved distribution. But, to secure the expected advantages, requires a rigid regard for and observance of the conditions contributory to the ends sought.

The primary purpose is to affect favorably the general system, on whose integrity all special parts of whatever nature ultimately depend. The correction of the defects appertaining to the general system, is naturally followed by those of the local manifestations. These are, in general, of the nature of imperfect local nutritive action, indicating clearly the need of the local supply, or at least local incentive to such action, easily afforded by local processes. Or such local defects may be in the nature of *surplusage*, embracing swellings, inflammatory or otherwise; often including irregularities of function, especially that of the nerves, as in case of pain.

Local conditions are usually of the nature of excess or deficiency. These are necessarily associated, but are in different parts. The local therapeutic requirement is not primarily local action, either imparted or semi-volitional: but the need of transit of fluid from the affected part to the general system. This affords local relief. As a general rule, it is futile to remedy any form of local excess, without at the same time providing for the nutritive defects of parts removed from the point of local excess.

We may now state the rules necessary to observe in practice to secure curative effects from the employment of the processes to be described.

Time.—All specialized processes or "movements," except where otherwise directed, are executed at a rate of motion differing from the physiological or natural rate.

In explanation, it may be stated that the living body is a natural rhythmic machine, beating time by its arterial pulsa-

tiöns, its respiratory motions, and its executive actions, as in walking and working. These different acts of portions of the body have appropriate mathematical relations to each other. For example, the normal heart beat is at about the rate of the limbs at their easiest action: the respiratory motions are about quadruple those of the heart, etc. In the processes whose descriptions follow, the rate of motion, when these are volitional, are *much slower* than natural motions, requiring an effort to attain the desired rate. Extreme slowness secures the following advantages:—

1. The prolongation of a volitional act increases the influence of the incentive proceeding from the will. It gives time for increased generation of the nerve power required to properly incite the active muscles.

2. There is consequently the advantage to the nerves of less exhaustion of the sources of nervous power. Nervous waste and replenishment are demonstrably proportional to the rapidity, rather than to the amount of energy expended. The sense of fatigue is obviated, and the mechanism is soon ready for repetition of the same or any other act. Indispensable whenever there is hyperæmia of nerve centres, as evidenced by local hyperæsthesia.

3. The prolongation of the time in which an act is executed vastly increases the muscular nutrition superinduced by the act. Quick muscular contractions allow but comparatively few muscular fibres to engage in contraction.

Localization.—The pathological fact of excess in some parts and deficiency in others of nervous energy and of nutritive support derived from the blood, affords clear intimation of the remedial need of reversing the operation of the causes promotive of this condition. This correction is to be expected from processes which tend to produce effects opposite the condition found. The processes should therefore be adjusted to increase nervous power and nutritive support as represented in the circulation of the blood, in localities

where these are defective, and this inevitably diminishes the same, at points where these are in excess.

Hence it is essential that prescribed curative processes shall be strictly localized: that is, that no other than the designated parts should participate in the action or process prescribed. To pursue the contrary course, is to defeat one important purpose of the process. For it is to be kept in mind that affected regions are more receptive than unaffected regions, and that what produces diffusion in the healthy, aggravates local hyperæmia whenever this condition exists already.

When physical activity is made to pervade the system at large, no proper remedial effect can arise. The effect is at best hygienic, and does not specially relate to the affection.

The tension, so to speak, of the energy becomes too low at the defective points. This tension of function of the various kinds represented in vital objects, needs to be raised, to complete the actions due. The various positions of the body and its members so particularly described in the succeeding pages, are mostly for the purpose of restricting the limits, and therefore increasing the local tension of the muscular energies called forth, and for securing the improved nutritive results of the act or process which raises the action from the pathological to the physiological sphere. Restriction, limitation and concentration are indispensable conditions for processes designed for the advantage of weak points of the vital organs, whatever be the name assigned by pathologists to the affections.

Limited Repetition.—The point at which the highest degree of concentration of energy, muscular and nervous, is attained, and at which the greatest and most perfect nutritive effects are secured, is at the moment when the acting instruments become most fully engaged in the process. This statement has particular reference to invalids. The purpose is to re-enforce, not to exhaust or unduly expend, the energies

that are evoked by the process, as would be the consequence of unnecessary prolongation or repetition of the prescribed action.

A movement process urges through a prescribed channel, in a prescribed direction, to a designated point or region, the onflow of nutritive support invited by the process. Undue repetition and prolongation of the act, diminishes rather than increases the net result. The lack of understanding this principle often causes unnecessary and injurious expenditure of the powers of weakened subjects; and possibly extends to the production of effects quite opposed to those desired. This leads to the condemnation of a remedial method which may not in reality have been tried on account of a lack of compliance with conditions strictly inseparable from it.

The remedial advantages to be derived from a process where the *will* is actively engaged, may usually be attained by from three to five well executed repetitions.

A word of protest should therefore be here spoken against the teaching and practice which implies that exercise (as distinguished from curative processes), are hygienically beneficial in proportion to its amount. That which would be a wrong basis for invalids, is also but in less degree for others. In the latter case there are however many modifying circumstances which do not apply to ill health.

Intervals between processes.—The nutritive consequences, initiated by a properly prescribed and executed process, last several minutes. During this interval the patient should maintain absolute quiet.

The necessity for the observance of this interval in quiet, is readily apparent. For, if another limited segment of the body be subjected to a similar impression, there would be a similar nutritive response in an opposite direction, involving the distribution of blood and of nervous energy to supply the demand created by the last process. This new demand being at another point, is in opposition to that created by the preced-

ing process, and the tendency will be to diffusion, rather than concentration of the conditions desirable for the increase of local nutrition if that should be the purpose of the process. To secure an unequivocal local increase of power, there should be allowed sufficient time for the effect of a process to become at least fixed, if not completed.

Recumbency.—The intervals of quiet between processes are best spent in the recumbent position. Any other position, as sitting or standing, requires the action of a portion of the trunk-muscles for support. Even this limited employment of muscles requires nutritive supplies, which are consequently diverted from the prescribed direction, and therefore detracts from the efficacy of the preceding process; the more so in proportion as the invalid is weak and the process a highly specialized one.

The advantages of recumbency during intervals of processes are well illustrated in cases of affections of the inferior portion of the trunk, as displaced pelvic contents and hernia. For the semi-voluntary act of a prescribed process includes the parts naturally engaging in rhythm which has become diminished, perhaps lost. The prescribed action decidedly re-enforces the rhythm, and causes it to extend so as to include the contents of the extreme lower portions of the cavities of the trunk and pelvis; and the general purpose of the processes becomes efficacious during the interval, in lifting the misplaced organs. The upright position diminishes the effect by adding gravitation, and also by diminishing the force of the rhythmic mechanism.

Co-operation.—Many of the processes whose descriptions follow, invite the powers of the invalid in the direction in which those of the assistants are also engaged. The energies put forth by each respectively flow over the same course, the muscles and nerves of the patient's members. The practical consequence of this class of processes is a more distinct local concentration of the nutritive effects, and

corresponding increase of capacity for vital energy, in designated and predetermined parts of the patient's organism—a more certain and rapid development of strength than is secured by exercise, however carefully employed.

The timely repetition of the processes to be described in the manner designated, results in training, or special cultivation of the local weak parts. But what is of still greater service to the chronic invalid, who has become disheartened and hopeless by the prolongation of his malady, those sources of his will-power which relate to his organism are also increased. The continuance of any morbid physical action is also an inverted training process, and reacts upon its sources. This involves corresponding morbid increase of cerebro-spinal activity.

The remedial use of specialized processes is therefore eminently adapted to the chronic invalid's greatest need. These processes render the will-power capable of pervading the organism, so as to displace inferior and perverted nervous energies, which are sure to possess the organism of the chronic invalid. His prolonged subjugation to pain, to the consciousness of ineffective organic control, and to the introspection inseparable from them, superinduces a habit greatly resembling the automatism of health.

While by means of the processes described the local parts are increasing in substance and power by the local increase of nutrition, their connection with the general system is strengthened, and the more abundant supply to such parts of the energies contributed by the whole, also contributes to establish the natural supremacy of the whole over the parts, instead of reversing this order, as in chronic disease. No ordinary remedy is capable of so thoroughly effecting this indispensable purpose.

PART II.

PROCESSES.

VARIETIES OF PROCESSES.

THE selection of the processes applicable in any given case is governed by—

1. The strength and constitutional peculiarities of the patient.

2. The nature and the degree of development attained by the local manifestation.

The varieties of processes relating to these are the following:—

1. *Self-applied Processes;* sometimes called single movements.—The execution of these depends solely on the strength of the patient, and his capacity to specialize his energies for the advantage of local defects. This class of processes are capable of remedying *hernial protrusion*, *rectal prolapse*, *uterine displacement*, *pelvic hyperæmia*, and the consequences of these, when there is a tolerable amount of muscular power, accompanied by unimpaired directive energy. This differs from *will*-power in the fact of its not ending in mental, but in muscular action; and as not terminating in a sense of fatigue, but as contributing to physiological automatism, or self-perpetuation of the wholesome effect.

2. *The Assisted Processes*, or as the Swedes call them the "duplicated movements." In these another person, an assistant, guides the direction, controls the force, and therefore governs the effect of the processes; effected in general

by supplying gentle opposition to action inaugurated and successfully executed by the patient; the processes are thus converted into a mild wrestle in which the patient is always allowed to be victorious.

This device causes the patient's powers, though feeble, to travel energetically in the designated direction. Necessary in cases having little muscular and less nervous power, since a portion of the energy appearing in the process is contributed, not by the patient, but by the assistant.

3. *Passive Processes.*—In these the whole expenditure is on the part of the assistant. The word "massage" is a nearly equivalent term. This class of processes is adapted to the most prostrate stages of the general health, and the most advanced stages of the local infirmity. They supply the impulse required to secure local nutrition, and this effect is extended to whatever part it may be required. The supply of impulse is from the exterior sources; either by the assistant, or from some mechanical power practically inexhaustible. This class of processes are in general preliminary to the kinds above described.

4. *Processes requiring Apparatus.*—Apparatus complies with the following requirements: 1st, To control the position of the patient, at the beginning and the ending of a process, so as to assure the localization and the certainty of the process intended. 2d, To afford the leverage necessary, both to aid the power of the operator and to intensify the predetermined local effects in the patient. 3d, To supply the connection between the different parts of the organism of the patient, and the unlimited source of power transmitted through this instrumental connection. The reader will understand this description by referring to cuts of mechanical processes in the present division of this book.

In the following pages these different kinds and forms of mechanico-physiological processes are intermingled. This is to enable the inquirer more readily to understand the mod-

ifications, and also the progressive forms of which the processes are susceptible, to meet emergencies requiring adaptations of the same principle. The experimenting novice will thus be aided to discover his real needs, and whether he can comply with them, unaided; or whether he will require the assistance of apparatus or of the skilled operator, or the prescribing physician, or of all.

XIII.

Special Processes Relating to the Upper and Middle Portions of the Trunk.

PROCESS 1.

Single, with Weight.—Adapted to increase the power of the anterior muscles of the chest and abdomen and to extend the habitual respiratory rhythm so as to include the walls of the abdomen.

Position.—The patient lies flat on his back, the legs and arms being extended in the same horizontal line and parallel with the body; the two hands grasping a weight, which at first should be small, as a book weighing one or more pounds, according to the patient's strength.

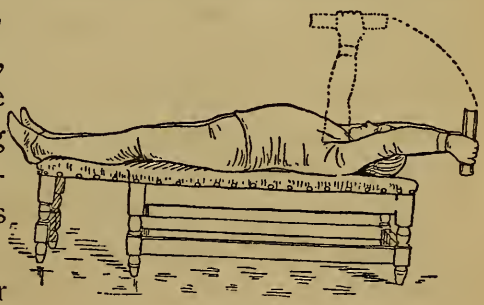

Fig. 1.

A long couch or the floor may be used for lying upon.

Action.—The weight is slowly raised, care being taken that the arms remain perfectly straight till they reach the perpendicular, when the leverage afforded by the arms which has constantly diminished, has ceased. After a moment's rest, the arms are allowed very gradually to return by their gravitation to the commencing position, extended at the full

length, horizontal and parallel. This process should be repeated four or five times, *very slowly*, with short intervals between each repetition. After the process, the patient should remain for five or more minutes, without change of position, in undisturbed quiet.

Effect.—The arms in this position are raised by muscles whose opposite extremities are spread over and attached to the ribs, which determine the form and size of the chest. All motions of the arms in the position described affect the chest through its muscles, according to the force of the action.

In the process described the chest walls are mechanically drawn asunder by the tension communicated to them through their muscles; and this effect is increased by the weight.

The expansion of the chest by this action, in an average person, is at first from one inch to an inch and a half at the lower border of the ribs: this increase of circumference gradually diminishes as the top of the chest is approached.

The increase of chest space produced by this and other analogous processes is due less to direct stretching or distention, than to other mechanical principles easily understood. The posterior ends of the ribs are jointed to the spine in a way susceptible of considerable latitude in the direction of their motion; while the anterior ends are drooping, and much less fixed in position. The pairs of ribs encircling the chest bear some resemblance to a hoop held at the side in the hand, the side opposite that held being not horizontal, but drooping. If the lower side be raised, it is seen that the hoop encircles a larger horizontal space, in proportion to such elevation of its depressed side. The chest space included by the ribs is increased and diminished in the same manner, by any mechanical force capable of raising the anterior ends of the ribs, an effect easily secured by means of the arms, especially when they are moved upward.

In consequence of the extension of the arms in the way

described, the amount of space included by the ribs is increased. This space is still further increased whenever an effort is made to raise the arms and the weight, because the arms act as levers to separate the chest walls, by a force equal to that represented in the muscular action, increased by the leverage afforded by the length of the arms. The process is mechanical so far as relates to leverage, weight, and variations of chest space: vito-mechanical, as relates to the power of the chest and arm muscles: physiological as relates to nervous incentive, muscular action and supply and waste or nutritive support.

The space included by the chest walls is increased by the process, say one hundred cubic inches. This increase is in part *above* the diaphragm and belongs to the respiratory space, occasioned by the increased demand in the lungs for oxygen of the air required to support the evolution of power or energy, nervous and muscular. This effect follows or rather accompanies all exertion, mental and physical alike, however feeble. The increase of space is in part, perhaps the larger part, below the diaphragm, and included in what in this book has been termed the intermediary space; this becomes immediately occupied by viscera, which of necessity moves upward. This transfer is accompanied by a corresponding depression of the anterior abdominal wall. No vacuum is possible, on account of the yielding nature of the abdominal wall, which offers no resistance to the atmospheric pressure, and follows up the chest-wall expansion, and really accomplishes the transfer of viscera to the more elevated position.

When the chest muscles are made to manifest power to the extent of their capacity, as when a weight is lifted, or manual resistance offered to their action, a corresponding extreme effect is produced. The power thus manifested, while apparently causing increase of the chest circumference is really expended in lifting the contents of the abdomen and pelvis.

No man is capable of exerting sufficient power to expand the chest, or to increase its circumference in the least degree, if it were possible at the same time to prevent the recession of the exterior abdominal wall; that is, if this wall were inflexible.

PROCESS 2.

Assisted.—To expand the lateral portions of the chest, separately.

Position.—Laying on the back, *one* arm extended parallel with the head, the other remaining by the side.

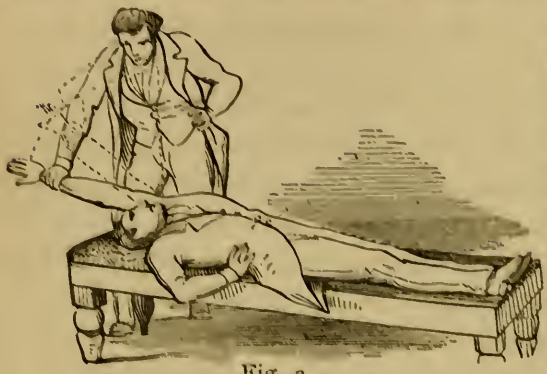

Fig. 2.

Action.—An assistant or operator places one hand on the wrist or hand of the patient, and bids him raise his arm to the perpendicular, while he meantime presses upon it so as to afford gentle resistance, but not enough to prevent the motion from being executed. The resistance is carefully graduated to the power of the patient's muscles, and is always just short of being equal to patient's strength. The degree of power exerted by the patient changes during the progress of the movement, being at first weak, afterwards stronger, and toward the end of the action, weak again. The motion may be repeated three times *very slowly* with each side, and must be followed by five to ten minutes of quiet.

Effect.—This is an example of what the Swedes call a *duplicated* or double movement, terms which signify simply that two persons are engaged in the one act.

The advantages of this class of process may still further be stated:—

1. The muscular fibre engaged in action is thus restricted to the least possible amount, affording the advantages of concentration in contrast with diffusion of power. Experience shows that much greater local effects are gained by restricting the amount of acting muscle.

2. The resistance is graduated to correspond with the varying power of the muscular fibres during the progress of the action, which is impossible with unchanging resistance.

3. Even the feeblest invalid is indued by living or vital opposition with increased incitation to endeavor or increase of will-power; which, being but momentary, is insufficient to cause fatigue, but decidedly strengthens the connection of the source of the incentive with the members; an effect greatly to be desired in all chronic cases.

4. The process is pointedly directed to a single object: and none of the ill consequences follow of useless expenditure and misdirected endeavor.

5. The nervous energies and the nutritive resources may be wholly applied to a single region or member: or each region may in turn become re-enforced, and the powers of the whole organism increased by a well-advised succession of processes. The capacity of the system to afford energy in any of its forms may in this way be raised to a higher point and to greater perfection of quality.

For reasons included in the above statements, this class of processes is eminently adapted to the needs of very weak and nervously discouraged invalids, who are incapable of even moderate exercise, as this term is usually understood.

PROCESS 3.

Apparatus.—To secure similar effects.

Position.—By this apparatus the weight and momentum of a swinging pendulum is transmitted through the arms to the chest, to increase the natural rhythm.

The back of the patient is applied to the pad adjusted to the height of the shoulder blades. The arms are extended upwards so that the hands easily grasp the handle which is adjusted to the length of the arms by this lever; the lever is connected to its extension below, by a ratcheted joint and pivot, and is attached to a sliding post to accommodate the height of the person.

Fig. 3.

The ratchet sets the lever forward or backward, and by this means either increases or diminishes the resistance and momentum afforded by the swinging of the weight, in accordance with the strength of the patient.

Action.—The patient in position has only to communicate a slight impulse through the lever to the weight, and the pendulum commences to swing, reacting on the anterior portion of the trunk, and all the muscles connected therewith; it continues to swing with a beat or rhythm corresponding very nearly to the natural respiratory motions, and requires only a slight impulse from the patient's hand which grasps the lever to continue its motion indefinitely.

Effects.—These resemble those produced by the preceding processes. The process affords the advantages of almost complete passivity; of extending its lifting effects to the lowermost portion of the cavity of the body; and of rhythm which agrees with and therefore re-enforces and extends the natural rhythm to its due degree; and it harmonizes by its simultaneous action the different portions of the organic mechanism connected with rhythm. It is an important, almost indispensable assistant for strengthening the action on which sustentation depends.

PROCESS 4.

Same Apparatus.—To expand one side of the chest, or the two sides in succession.

Position and Action.—The patient applies one side of his chest under the arm near its middle portion to the pad, while the hand of the opposite side grasps the handle of the lever, and by a moderate impulse from the hand the pendulum weight is made to swing. The ratchet must first be adjusted to the strength of the patient. After one side of the chest has been sufficiently acted upon, the other side is subjected to the action. Each side may receive fifteen or twenty motions from the apparatus.

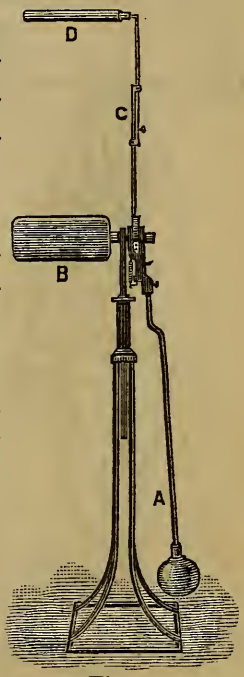

Fig. 4.

Effects.—One side of the chest is rendered passive while the action of the other is nearly doubled by this process. The compression of one side against the pad and the communication of rhythmic expansory motion to the other with the aid of the leverage and the weight produces the effect stated.

The action which expands one side communicates tension to the muscles of that whole side of the trunk, including the muscular and tendonous connections with the pelvic bones at the groin, the region of hernia, which therefore become strengthened, and their lifting and resisting capabilities are thereby increased.

If, during the process, the assistant applies strong upward pressure by his hand placed just above the pubis, or at the base of the trunk where the tension is strongest, the lifting effect is greatly increased. The pressure should be supplied rhythmically, to correspond with the motion controlled by the pendulum.

PROCESS 5.

Single and Assisted.—To develop the muscles of the trunk; expanding the upper and contracting the lower portion of the space included by the trunk-walls.

Position.—Standing, feet close together, hands grasping some firmly fixed object directly overhead, as high as can be conveniently reached.

Fig. 5.

Action.—By a slight effort the trunk is made to gyrate in a circle of which the hips describe the widest part, while the feet and hands remain unmoved. A dozen or more revolutions may be performed in each direction. The cut indicates the position and the dotted lines the extent of the action.

Effect.—In this process the muscles on the convex side of the body are strongly stretched by the weight of the body which falls upon them. This affords a powerful incentive for their contraction. As all sides bear the weight and the momentum added thereto by the circular motion in rapid succession, it follows that the action is but momentary for each particular part. The patient enjoys the advantage of much motion with the least possible effort. The alternate contraction and relaxation of all the tissues of the body is a powerful aid to the circulation in its exterior parts, which is increased by the distinct centrifugal effects produced by the circular motion.

Modification.—An assistant seizing the patient near the hips may impart all the force required for the execution of the process. In this case the muscular action of the patient is increased by the extent of the impulse afforded by the assistant, the whole of which falls upon the patient's muscles,

while the patient is saved from any action of the will power except that required to maintain his grasp. In this way the effects of the process are greatly increased.

PROCESS 6.

Fig. 6. *Single, and Assisted.*—To secure similar effects in the sitting position.

Position.—Sitting on an ordinary stool of usual height, the feet wide apart and kept in contact with the floor by being placed under some convenient object, as bureau or sofa. One arm is stretched perpendicular, nearly in contact with the head; the trunk and head perfectly erect, the other hand placed on the hip of the same side, fingers forward, thumb behind.

Fig. 6.

Action.—The trunk slowly bends exactly sidewise as far as it can over the hip on which the hand is placed, the upstretched arm meantime carefully maintaining its relation to the head; and then slowly returns to the commencing position. This act may be repeated three or four times; afterwards the other side may receive the same action.

Effect.—Similar to process 4, but produces more concentration of effect at the side.

Modification 1.—The effect may be increased to any extent desired, by holding a weight in the hand of the upstretched arm during the process.

Modification 2.—Instead of a weight an assistant may supply resistance by grasping the upstretched arm of the patient and acting in opposition to the patient's efforts.

PROCESS 7.

Single.—To restore the abdominal rhythm, urge upwards the contents of the cavity of the body, and strengthen the tissues at the base of the abdominal wall.

Position.—Standing erect on the knees which are placed wide apart on a cushion to prevent disagreeable pressure; the arms stretched upwards parallel, hands grasping a small weight.

Fig. 7.

Action.—The trunk bends to one side in the transverse plane of the body, keeping the arms straight and parallel, and without disturbing the position of the legs. It then returns beyond the perpendicular in the same plane, bending as far to the opposite side. This swaying motion from side to side is repeated ten or fifteen times, after which the patient should lie perfectly quiet for a few minutes.

Effects.—Extreme sidewise bending produces corresponding tension of the convex side, which extends to the attachments of the muscles by their tendons at their junction with the pelvic bones at the base of the abdomen.

The alternations of motion superinduce nutritive effects and develop the muscular and the resisting power of the same parts, and decidedly increase the space in the region of the diaphragm.

Until sufficient strength and suppleness have been acquired, the process may be executed with the two hands clasped over the head, instead of being stretched upward, as in the cut.

PROCESSES 8 AND 9.

Assisted.—To increase the chest-space and chest-power, available for control of the position of the whole visceral mass, both abdominal and pelvic.

Position.—Reclining on a suitable couch, susceptible of adjustment of the trunk to a proper inclination, the assistant standing behind the head of the patient.

The patient's elbows are flexed so as to bring the hands palms upward near his shoulders. The assistant bending forward, grasps and firmly holds the two hands of the patient.

Action and Effects.—The assistant slowly recedes, and in so doing gently draws upward and backward the two arms of the patient until they are entirely straightened and parallel with the trunk. The pulling is continued and its effect extends to the ribs and gently draws them asunder, increasing the circumference, distending the diaphragm; and by increasing the intermediary space, causing the whole mass of visceral contents to the lowest part of the cavity to move upward. The abdomen flattens, and atmospheric pressure is available over the whole of the boundaries of the cavity, from the perineum to the diaphragm.

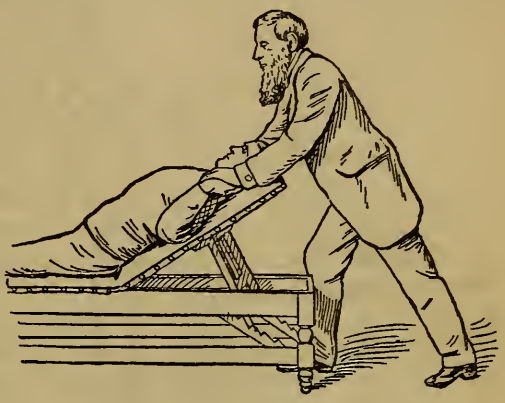

Fig. 8. Commencing position.

After a few moments' pause, the arms of the patient are allowed slowly to return to the commencing position. This process may be repeated four or five times, with intervals of a few seconds.

The above described process is entirely passive; and not tasking the will of the patient not only produces no fatigue,

but affords positive rest, as it both deepens and aids the involuntary act of respiration.

Modification 1.—The patient may offer resistance to the efforts of the assistant. His will power now receives a gentle but indisputable stimulus from the incitation afforded by the assistant. This enables him instinctively to put unusual vigor into the acting muscles, greatly increasing the nutritive effects of the process.

The assistant should be advised that the resistance he offers should be adjusted to the varying power of the patient's muscles in the different stages of the process; weak at first, afterwards stronger; then again with diminishing vigor till action ceases. The action should not be repeated more than three or four times, and very slowly.

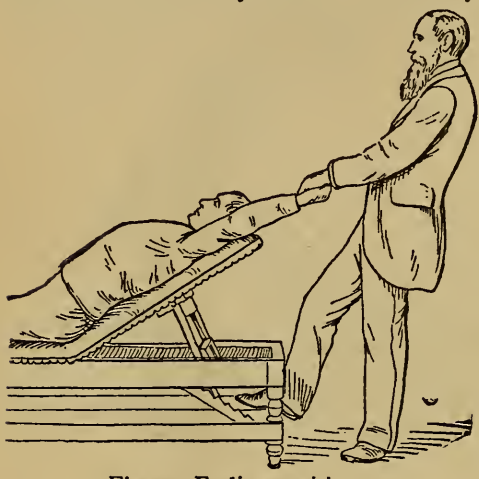

Fig. 9. Ending position.

Modification 2.—The above described process effects only the chest muscles *below* the shoulders. To call into similar action those *above* the shoulders, those of the top of the chest and neck, the resistance offered by the assistant should be *reversed;* that is, he should *push* against the patient's efforts to straighten his arms.

Modification 3.—The process may be limited to one side, whether performed in either of the ways described, whenever there are good therapeutic reasons for so restricting its effects, as when there is greater weakness or deficient size of one side of the chest.

Or, the two sides may submit to the same process in succession, whether it be passively or actively performed, and whether it be applied to the lower or upper portions of the

chest, or to both. By this latter method, as before explained, greater therapeutic effects are assured; because (1) the whole of the available power of the body is transmitted to a smaller part or area, which implies the more energy for the less volume of vital substance; (2) because the nutritive effects are proportionate to the time employed in the execution of the process, which in the latter case is doubled.

PROCESS 10.

Single, or Assisted.—To increase the power of the abdominal muscles and of the tendons at their lower termination.

Position.—Sitting, knees and feet wide apart, the feet held to the floor by some device; the arms upstretched, and to secure their parallelism, grasping some light object, as a stick.

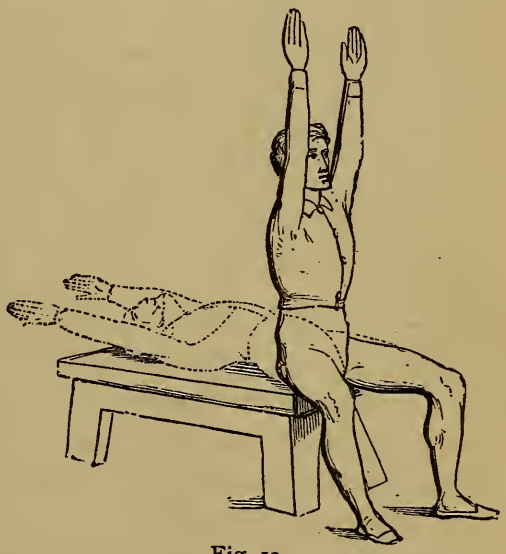

Fig. 10.

Action.—The trunk is allowed to fall exactly rearwards, very slowly; when the muscular strain has reached the extent desired, the trunk returns to its upright position. This action may be repeated three or four times with momentary intervals.

If this action consumes more strength than the muscles can well bear, the process may be made easier by clasping the hands on the top of the head, which affords less leverage of the arms.

A still milder form of the process may be obtained by placing the hands on the hips.

Modification.—This process may be converted into an assisted process. An assistant standing behind the patient grasps his wrists, and gently pressing upon them, increases the action of the patient's muscles.

Or, if the patient be very weak, instead of adding to the resistance, he sustains in part the weight of the patient in the act of backward falling, and assists the recovery of thest arting position. In this way the assistant performs the often very necessary office of adjusting the process to the patient's capacity and need, however feeble he may be.

PROCESS 11.

Single, or Assisted.—To concentrate the effects of muscular tension at the base of the abdomen.

Position.—Sitting, trunk, legs and feet as in 10, one arm stretched upward to its full extent, the hand of the other fixed upon the hip, the trunk slightly twisted, bringing the raised arm forward.

Action.—The trunk slowly falls diagonally backward and sidewise, instead of directly backward as in 10, as far as it conveniently can, where it remains momentarily. It then slowly resumes the commencing position. After three or four repetitions, the positions of the arms are exchanged, so that the hand previously raised is placed on the hip, while the opposite arm is stretched upward, and the same process is repeated by the other side of the body in the same way.

Effects.—The weight and leverage of the falling and rising trunk falls principally upon the muscles whose tendinous connections are in the region of hernia. Not only is the resisting power of these tissues increased and the muscles strengthened, but the intermediate space of the two sides is enlarged, and the contents of the trunk and pelvis urged upward, toward this space; the downward pressure and obstruction to the return circulation it affords, is prevented.

This process may also be performed by the aid of an assistant, with the same advantages as described under the preceding processes.

PROCESS 12.

Single, or Assisted.—To secure similar effects at the base of the abdomen with less expenditure of strength.

Position.—Sitting, with the feet well apart and fixed to the floor, the hands clasped on the head.

Action.—Instead of bending backward, as in the preceding examples, the trunk is made to gyrate, the head describing a broad circle, while the seat remains unmoved. This rotary motion may be performed six or eight times in each direction. If the strength be insufficient for the process, the hands may be fixed on the hips instead of the head, when less strength will be required.

Fig. 11.

Effects.—This mode of acting on the muscles and their tendinous extensions, affords only a momentary strain and incitation to any single part, but all parts at the base of the body are brought successively and equally under its action. The process specially produces much gliding of the peritoneal surfaces of all the visceral organs, similar to what occurs in health; a very necessary condition for securing the health of these organs It is peculiarly adapted to the kind of inertia whose effects are manifested in inaction of the lower bowel and of the contents of the pelvis in general.

This process also may be assisted by grasping the shoulders from behind, and aiding or resisting the inclination of the patient's body, as may be required.

XIV.

Special Processes Relating to the Middle and Lower Portions of the Trunk.

PROCESS 13.

Single.—To increase the power of the muscles of the abdomen and their lifting function.

Position.—The elbows rest on the edge of a table or other convenient support of about the same height; the feet on the floor are about three feet in the rear of the elbow support; the trunk is therefore in a diagonal position being inclined forward in a straight line, the support of its weight divided between the feet and the elbows.

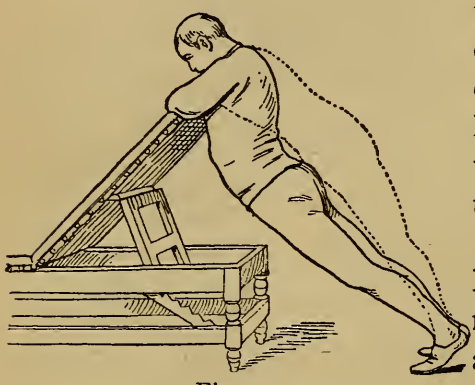

Fig. 12.

Action.—The trunk slowly bends forward at its middle portion, producing a strong anterior convexity. It next recedes beyond the straight line, producing now a posterior convexity of its outline. This action may be repeated six or eight times. Great care is required to maintain the correct position of the knees, elbows and trunk.

Effects.—In the position described the arms and therefore the chest walls are immovable, and the chest distended. It follows that the strong power exerted by the combined abdominal muscles which is required to straighten the body, lifts the mass of visceral organs, including those of the pelvis, to a higher position. The use of these muscles strengthens them, and they more easily participate in the respiratory rhythm, whereby their continued strength is assured.

The strengthening effect is conspicuous at the hernial border, where the fibres entering into the composition of the hernial neck are made tense by the action and compelled to coalesce, and thus to contribute to obliterate the canal. The effect of the process reaches the pelvic contents.

PROCESS 14.

Single, or Assisted.—To strengthen the mechanical tissues at the base of the abdomen and to raise the contents of the pelvis.

Position.—Lying on the back on a plain hard couch by which the trunk is supported to the hips, while the legs extend beyond its border drooping and unsupported, the hands firmly clasped and bearing on the top of the head.

Action.—The knees remaining perfectly straight, the feet are very slowly raised from their support to the distance of one or two feet by bending at the thighs only. After a momentary suspension, the limbs are allowed slowly to descend till the starting point is reached. This action is repeated four or five times; a few moments of inaction between each effort should be interposed.

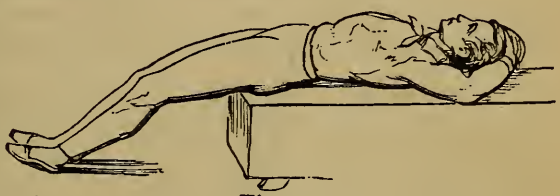

Fig. 13.

If it be found (as in many cases of local disease it will be) that the strength is insufficient to raise both limbs simultaneously, then one at a time should be raised and lowered in alternation, till the strength becomes adequate to raise both simultaneously.

If the patient has insufficient strength to execute this process, an assistant may bear a portion or even the whole of the weight of the legs by grasping the ankles, while the raising is performed, as before described.

Effects.—The lying position removes the obstacle of gravitation; the position of the hands renders the exterior chest-walls immovable. The motions of the respiratory rhythm are therefore confined to the only part of the chest wall that is movable, which is the diaphragm. The piston motion of the diaphragm is transmitted entirely through the whole visceral mass, including the contents of the pelvis, which are therefore distinctly raised at each returning expiratory act. The effort to raise the legs causes this extension of rhythm to become vastly augmented, so that an upward drawing effect is felt. The raising of the legs in this position is mostly effected by the interior muscles; these are indirectly related to the depressed viscera, and their contraction contributes considerable aid to the upward urging of the process.

The raising of the viscera of the trunk is therefore due to these combined causes. (1) The increase of intermediary space, caused by the position of the arms. (2) The extension of the respiratory rhythm by the same cause and by the coincident effort. (3) The action of the local abdominal muscles, exterior and interior, which both diminish the abdominal space, and force upward the contents. (4) The absence of gravitation and of all obstacles to the production of the effects assigned. This and similar processes are effective in all cases of both extrusion and intrusion, and cultivate the resisting power of the local tissues to any desired degree.

PROCESS 15.

Single.—To produce effects similar to the preceding: adapted to weaker persons.

Position.—The same as in 14.

Action.—By means of a slight effort a perpendicular swinging motion is communicated to the legs, which therefore rise and fall with but little strain or expenditure of strength. As motion in this position is liable to act with some severity on

account of the momentum of the limbs, it is best to mitigate its degree if felt disagreeable. The pendulum-like motion may be repeated twenty or more times according to the strength.

Effects.—The position produces great tension of both the anterior muscles of the trunk, and the internal muscles which raise the legs. By the action of the former, the abdomen is flattened, its space diminished, and its contents crowded into the more liberal space produced by the position of the arms and chest. By the action of the latter muscles which are in immediate relations with the pelvic contents, these contents are raised; the muscles are caused to receive larger accessions of blood, producing a revulsive effect on the congested capillary mass of the pelvis. This process also develops and strengthens the hernial tissues.

PROCESS 16.

Assistant.—To increase the function and power of the small muscles connected with the head of the thigh.

Position.—The patient reclines easily on a couch, the shoulders slightly raised. One leg is extended parallel with the trunk, the other is raised so that the thigh makes right angles with the trunk, and the knee with the thigh; the assistant grasps the flexed leg near the knee with one hand, and the foot of the same leg with the other hand.

Action.—The leg held by the assistant is made to revolve in a circle of which the thigh joint is the pivot or centre. It is important that the foreleg of the patient be kept parallel with the other leg and with the trunk, and also that the circle described by the revolving knee and that described by the foot be alike in diameter. Any considerable deviation from this direction may cause strain of the tendons of the thigh joint: this is impossible if the caution above stated is properly observed. Each leg may revolve in the way described three or four times in each direction.

Effects.—This process brings into vigorous but entirely passive action all the muscles connecting the upper part of the thigh with the pelvis, some of which, by their attachments, reach its interior. The strong tension of these muscles and their alternating action, produces an afflux of blood to them, affording decided relief to the overdistended vessels of the pelvis. The process is therefore of unqualified advantage in pelvic hyperæmia, whatever be the organ principally affected.

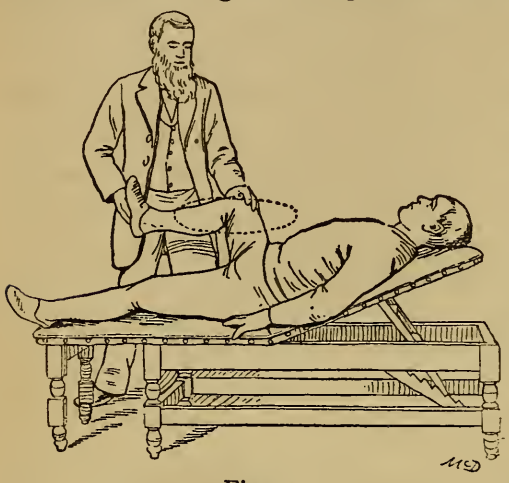

Fig. 14.

This process also mechanically affects the hernial canal; develops, strengthens and thickens the hernial tissues. At each revolution of the leg the hernial opening is compressed, tending greatly to its obliteration.

PROCESS 17.

Single.—To produce similar effects.

Position.—Standing, resting firmly with the whole weight of the body bearing on one leg, one hand extending to a table, or any near object, for steadiness and support.

Action.—By a slight effort, the body is turned on its axis while the foot upon which the body rests, remains unmoved and fixed on the floor: the other leg is allowed to swing enough to accommodate the twist given by the trunk and to assist and not hinder the action. The action described causes the leg by which the weight is borne to become twisted: the effect extending through the length of the leg

and causing strong mechanical tension of the muscles connecting the thigh with the pelvis. The body then returns beyond its commencing position; that is, twists the leg in the opposite direction. The process of alternate twisting action is repeated ten or a dozen times. The same process is then executed with the other leg.

Effects.—These are similar to those following the preceding process. Although nearly passive, the action produces strong effect on the small muscles of the thigh, which extends to the more massive ones of the leg; and is followed by powerful revulsion, which is of decided advantage in cases of pelvic congestion, whatever be the special seat of that symptom.

PROCESS 18.

Assisted.—To strengthen the muscles about the pelvis, and remove pelvic hyperæmia.

Position.—The patient reclines, legs extended, in a line with the body; one of the legs rests upon the knees of the assistant, who sits convenient for this purpose. The foot and the knee of the leg thus held are firmly grasped by the assistant.

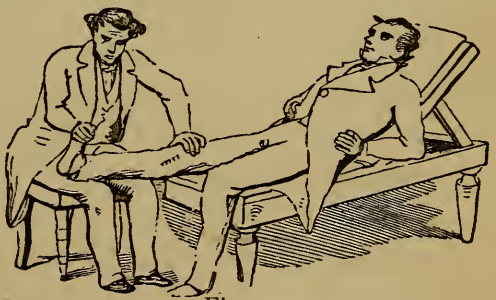

Fig. 15.

Action.—The patient twists the leg thus held upon its axis, while the assistant resists the effort of the patient, both with the hand applied to the foot and that holding the knee, but not with sufficient force to prevent the motion of twisting, which stops only when the limit afforded by the mechanism of the parts is reached. The leg is then turned back to the starting point and the action repeated three or four times. It is then twisted in the opposite direction in the same manner against resistance sup-

plied by the assistant as many times. The same process may then be applied to the other leg.

Effect.—In this process nearly the same muscles are engaged as in processes sixteen and seventeen, but with much greater effect, on account of the graduated resistance supplied by the assistant, which is a means of incitation to greater muscular action; and also on account of the repose of the remainder of the system, which enables it to command more energy for the special act.

The mechanical effect of the process, is to close the opening or neck, in either variety of hernia. See Gray's "Anatomy," pages 694, 703 and 707. The physiological effect is to strengthen the tissues encircling the neck, and to increase their resisting power. The mechanical effect is to draw in protrusions. This effect is demonstrable during the act of twisting the leg in the position and in manner described. The hand of the physician placed upon the protruding part, feels it recede. This effect is partly due to sympathetic action of muscles not directly engaged in the special act of twisting.

The proof that the same process causes elevation of the contents of the pelvis is perhaps less direct but no less satisfactory, when time has been given to secure the permanent effects due to cultivation. The process contributes an undoubted powerful aid to sustentation.

PROCESS 19.

Single, or Assisted.—To incite nutritive activity in all the tissues of the lower portion of the abdomen and hips.

Position.—Lying, with the shoulders raised, the hands clasped over the crown of the head; or, if necessary, in steadying the body, by holding the sides of the couch on which the body rests. The hips must be near the edge of the couch, so that the legs may swing clear, on a lower level.

Action.—The legs are carried to one side by bending at the hips. The feet are then made to revolve in as wide a circle as possible while the knees are kept straight and the legs in close contact. After three or four revolutions, the motion may be reversed, and the action repeated in the opposite direction.

Effects.—The great tension of muscles, tendons, ligaments and connective tissues required for the execution of this process in opposition to the weight and the leverage of the legs, strongly conduces to strengthen all these parts, and to remove the local weakness which is popularly regarded as the sole factor of mal-position of the pelvic contents, and of hernia. The contractile function of the masses of muscle engaged in the act is increased, and the mechanical and resisting function of the connective tissue are improved by the process. The beginner is cautioned not to overdo the action.

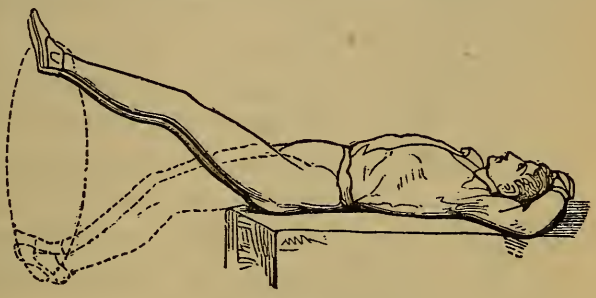

Fig. 16.

Modification.—An assistant may grasp the patient's legs near the feet and supply the power required to execute the process, and the changes of direction described. The process then becomes passive, and adapted to very weak invalids. Or, he may supply so much assistance as is needful to compensate for the patient's deficiency.

PROCESS 20.

Single, or Assisted.—To develop the power of sustentation, and the mechanical tissues connected with hernia and the pelvis.

The act of twisting the body (in distinction from turning it) brings into requisition a class of important muscles reached by no other process. These are the transverse and oblique muscles of the trunk, which extend a part of their fibres to the hernial region and form a portion of the tissues at fault in hernia. This class of muscles have a no less important function than that of raising and sustaining the contents of the pelvis. The existence of affections in these parts is excellent evidence that the function and the power of this class of muscles has seriously declined, and demands restoration as the condition of recovery.

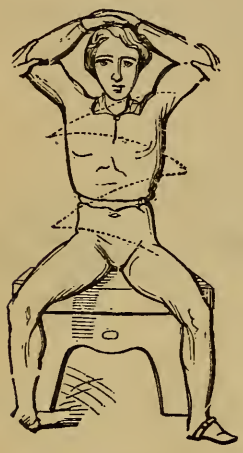

Fig. 17.

Position.—Sitting, the knees wide apart, the feet also separated as far as convenient, and fixed in place by being placed under a piece of furniture adapted to hold them in place, as the lower part of a bureau or sofa, the hands are clasped on the top of the head.

Action.—The trunk, maintaining itself erect and straight, twists upon its axis as far as it can without moving, upon the seat. The direction of the motion is then reversed, and it twists in the opposite direction to the same extent. The process of twisting the trunk may be repeated five or six times each way.

Modification 1. *Assisted.*—The assistant stands behind the patient and grasps his elbows. When the patient twists his body, the assistant offers such resistance as just fails to prevent the action, thus drawing out vigorously the patient's endeavor, and greatly increasing the action of both the muscles and nerves.

Effects.—This process powerfully contracts the abdominal muscles by which the motion is accomplished; especially the transverse and the oblique. It therefore diminishes the

abdominal space, coincidently with increase of the chest-space secured by the conjoint effect of position and effort. This process lifts the whole mass of contents of the abdomen and pelvis.

During the process the seat of the patient must be immovable, otherwise the effect is prevented. The reader should carefully distinguish between turning the body, which produces no effect, and twisting it.

Modification 2.—This relates to the position of the trunk. If the trunk incline *backward*, the position causes the weight of the body to fall upon its abdominal muscles. This increases the resistance, and therefore the muscular action, and may serve as a substitute for an assistant in this respect. It also increases the muscular strain on the tendons connected with hernia, hardens them, and increases their resisting power; while it also increases the lifting of the contents of the cavities, as before described.

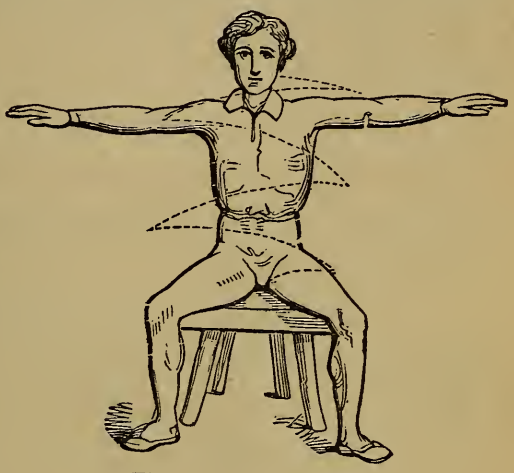

Fig. 18.—Modification 4.

Modification 3.—If the body be inclined to one side while executing the act of twisting, the muscles and tendons of the opposite side, especially of the hernial region, receive the principal effect of the process.

Modification 4.—This relates to the leverage afforded by the position of the arms. If the arms be extended horizontally at each side, and the process be performed single, the motion is slower. If the assistant opposes the motion, by bearing at the hands in an opposite direction, the leverage

and resistance engages the greatest possible power of the muscles concerned in its execution.

Modification 5.—If the hands of the patient rest on his hips, and the assistant offers resistance at the elbows, the leverage of the arms is diminished, and the process is adapted to a weaker class of invalids.

XV.

Special Processes Relating to the Central, the Central and Upper, and the Central and Lower Portions of the Trunk.

PROCESS 21.

Single.—To cause action of the muscles and tendons of the trunk, and to increase the flow of blood to the periphery.

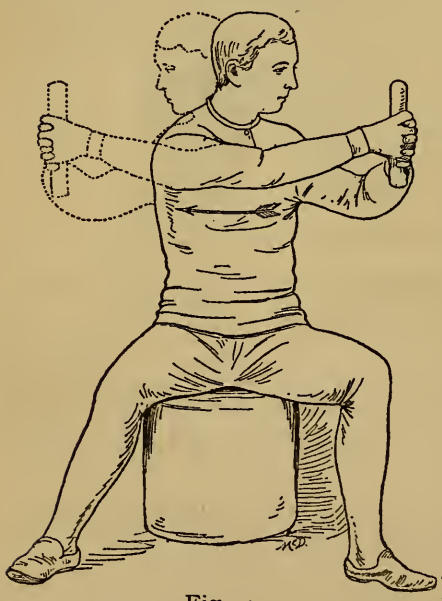

Fig. 19.

Position.—Sitting, the trunk erect, the feet and legs apart and immovable as preceding examples, the arms horizontal, elbows bent so that the hands, meeting in front of the body, grasp a small object, as a book, or dumb-bell.

Action.—The trunk twists on its axis as in 18. The execution may be rapid. In this case, the weight of the extended arms, with the addition of that of the object grasped, causes momentum, which is available at each change of direction of motion. The motion may be repeated twenty times or more, according to the amount of effort bestowed on the action.

Executed rapidly, another effect of the process becomes conspicuous, of significant value in many cases. The centrifugal effect of rapid circular motion, combined with alternations of compressing and dilating the circulatory vessels, causes the fluids of the body to become urged very forcibly to the superficial parts. The skin becomes reddened, and the respiration more profound. Of great service in some forms of chronic hæmorrhages.

To cultivate the power of twisting the trunk is of great advantage to health. The action affords compensation for the disadvantages arising from the erect position, under which the inferior portion of the trunk incidentally labors. This action neutralizes the effect on the interior organs arising from their gravitation.

PROCESS 22.

Single, or Assisted.—To combine the effects of preceding processes with aid from gravitation.

Position.—Lying face downward, the elbows, toes and central portion of the body resting on a suitable hard mattress or floor, the arms and feet being perpendicular to the elbows and the toes on which the weight of the body falls.

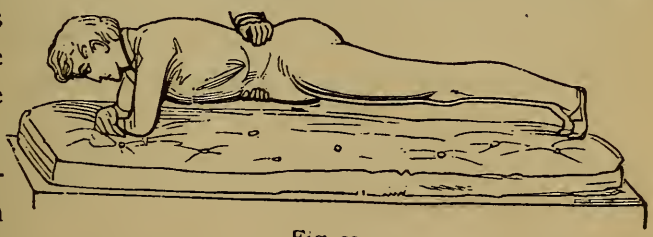

Fig. 20.

Action.—The portion of the trunk resting on the couch is made slowly to rise and to assume a straight and horizontal position in which only the elbows and the toes are in contact with the couch. After a momentary suspension in this position, shown in the cut, the trunk is allowed gradually to resume its first or commencing position. The act may be repeated three or four times, the proper intervals always intervening.

Effects 1.—Gravitation being invariably in the direction of the earth, it follows that in the horizontal position of the trunk it is at right angles to its axis, and therefore *from* the pelvis. This reverses the action of the cause of pressure. The elasticity of the tissues of the abdominal wall and the mobility of the interior organs, conjoin in favoring the greatest effect of gravitation, which now draws from instead of compressing the lower portions of the trunk, and its contents.

2. The exterior walls of the chest having been rendered immovable by the fixed position of the arms, it follows that the motor mechanism of respiration can now act *only* through the diaphragm, and that consequently the rhythm becomes practically a pump, without even the obstacle of gravitation to oppose its efficiency; and it also follows that this mechanism expends its whole power in moving upward, not only the solid organs, including the digestive and the generative intestines, but also any inert fluids, as congestion and its concomitants, whether within or outside the blood-vessels.

3. The act of raising and sustaining the weight of the trunk is effected only by means of very strong action of muscles, which are confined (by the position) to the anterior walls of the abdomen. The whole of the energy at the command of the patient is therefore employed as auxiliary to that of the gravitating force previously described. The three powers, gravitation, rhythm, and volition are combined in one effective act of pulling the contents of the abdomen and pelvis upward. This process alone is often sufficient to remove entirely and permanently prolapse of the rectum, uterus, and hernial extrusion and intrusion. By systematic practice of this process of lifting, the effects of which extend to the pelvis, the muscles engaged acquire great power and increased extent of rhythm, and the supremacy of the conditions for sustentation become unequivocal and permanent.

Assisted.—The assistant places one hand on the lower por-

tion of the abdomen and the other opposite, on the back, and makes strong pressure.

If the patient is too weak to assume the horizontal position unaided, that is, to raise the body from the couch, the assistant gives sufficient aid to execute the process. If the patient has strength enough to raise more than the weight of his body, the assistant resists the patient's efforts in accordance with the patient's strength.

Modification 1.—This process admits of variations to suit the desires and needs of the self-helping, experimenting invalid. Thus, he may secure a lesser degree of the effects, by lying face downward, his breast supported by a chair or stool, and his legs by another stool. In this position the abdomen is free to gravitate. He can easily increase or diminish the muscular participation in the process by varying the distance between the two supports.

Modification 2.—He can increase the effect of gravitation without increasing the muscular strain, if there be need of caution in this respect, by having the support for his legs *higher* than that under the chest. A frequently extemporized process is that of resting the elbows on the floor while the thighs are supported on a bed, considerably higher.

PROCESS 23.

Single.—To combine the aid of gravitation with auto-manual assistance.

Position.—Lying on the back on a hard couch, the feet drawn up so that the heels nearly or quite touch the lower end of the trunk, the arms free.

Action.—While the feet remain inflexibly in the position described, the hips, by a proper effort, are raised as high as possible, so that the thighs and trunk are in one straight diagonal line from the knees to the shoulders. This act reverses the direction of the gravitation of the contents of the

trunk. The hips now being highest, the abdominal and pelvic mass is shifted toward the head.

While the trunk is in this position, the hand of the patient may be employed to press upon the lower part of the abdomen, while the tissues are completely lax and offer no resistance. The whole power at the command of one or both hands may now supply force, acting in the same direction as gravitation to increase its effect to any needed degree.

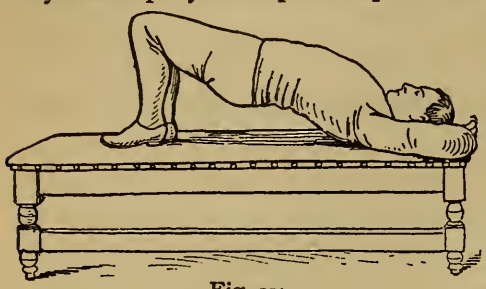

Fig. 21.

Effects.—These are very positive as relates to shifting upwards the mobile contents of the trunk; less positive as relates to cultivation of the muscular and rhythmic power which affords sustentation. The process is effective for the relief of extrusion and intrusion.

PROCESS 24.

Assisted.—To secure extreme expansion of the intermediary portion of the trunk, and extreme muscular action of the anterior abdominal walls, re-enforced by reflex incitation.

Position.—Kneeling at the edge of a well cushioned support about three feet high, the knees wide apart to increase the base of support, the arms extended forward and firmly resting on the two shoulders of the assistant; the latter stands immediately in front of the patient, convenient for this purpose, and places his two hands on the sides of the patient under the arms, to afford support, security, and assistance.

Action and Effects.—The assistant, maintaining his connection with the patient and the patient with him, takes a step rearward. This increases the distance between the two, and causes the trunk of the patient to fall forward, and to assume

a forward inclined position, which inclination is increased in proportion as the assistant recedes; the patient's arms are drawn upward, and the muscular connections with his chest-walls are put in strong tension, widening the base of the chest, distending the diaphragm and increasing the space of the epigastric region of the patient's body to an extreme degree.

At the same instant the necessity for supporting the trunk on account of its tendency to fall, causes the abdominal muscles to become severely contracted. This, with raising of the

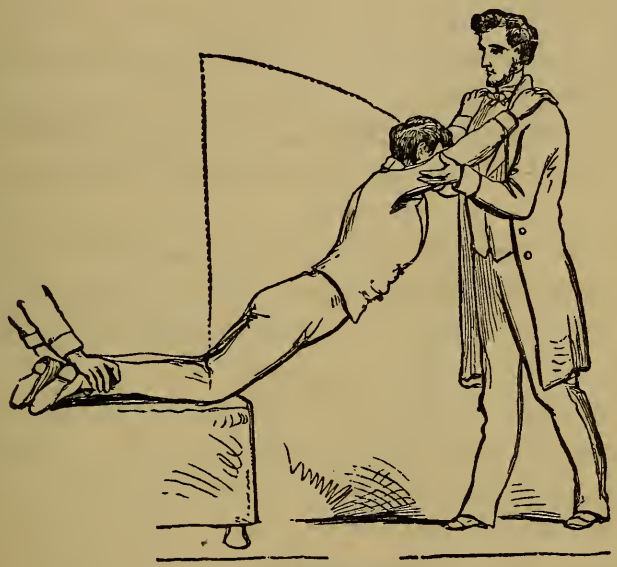

Fig. 22.

ribs at the same instant increases the power and effect of the contraction of the abdominal walls.

It will be seen that the whole of the anterior muscles of the trunk are put in extreme tension by the weight of the trunk which falls upon them, and invites their resistance. The effect of the contraction of the upper half of these muscles is to *distend* the lower portion of the chest and upper portion of the abdominal cavity. The effect of contraction of the lower or abdominal half is to *contract* the abdominal

space, and urge its contents into the space above, in which there is coincidently a tendency to vacuum. It follows that these two effects co-operate to secure the same end of raising the contents of the whole trunk, including the extreme lower or pelvic portion; and also to cultivate the power of the mechanism by which this effect is secured.

The extent of this effect is controlled by the assistant, who having secured it proportionate to the strength and need of the invalid, replaces him in the starting position, erect, kneeling. This may be repeated three or four times.

Modification 1.—By the aid of another or second assistant this process is available to the weakest invalid. The second assistant places one hand on the lower portion of the abdomen of the patient, and the other opposite, on his back, as in process 21. The office of the second assistant is two-fold.

1. He supplements by his own muscular strength the deficiencies of the weak patient; at the same time secures by timely attention to the needs of the patient the proper kind and degree of effect of the process.

2. The compression of the abdomen of the patient by the hand of the assistant is an unusual relation. It therefore incites strong reflex action of the abdominal muscles of the patient, which is an addition to, and co-operates with, the patient's endeavor; in this way the effect is not only greatly increased but at the same time ameliorated. The considerate operator soon learns that the kind of effect produced is under his control; much depends on his judgment of the patient's ability. If he causes the patient to incline strongly forward, the effect is greater; if but slightly, the strain on the abdominal muscles is easily borne, even by the very weak. The purpose of the operator is not to produce the greatest mechanical effect, but the best possible adjustment of the process in each of its parts to the patient's developing strength where it is needed. The most valuable effects often flow

from engaging the fewest muscles; these become the recipients of the power afforded by the general system.

In furtherance of this end the assistant may turn the patient one side by giving a slight twist of his body. This causes muscular tension at one side only, but in greater degree. The two sides may be subjected to the action in alternation. Three or four repetitions of the action are sufficient to produce the best effect.

PROCESS 25.

Apparatus and Assistant.—To urge by combined gravitation and manual force the contents of the cavities of the abdomen and pelvis upwards; applicable in hernial and rectal protrusions, and in hyperæmia and displacement.

Position.—The patient lies on his back, hands clasped on the crown of his head, the feet drawn up close to the body, on an apparatus constructed for the process.

Fig. 23.

Action.—By the pressure of the assistant's foot upon a lever, the hips of the patient are instantly raised so that the trunk and legs are in the same line. The patient is prevented from sliding by appropriate attachments of the apparatus, while in this face-upward, diagonal position, with the feet and head on the same level, and the pelvis much the highest, the contents of the whole cavity gravitate towards the intermediate portion of the body, now greatly distended by the position of the hands and arms.

While the patient remains in this position the assistant presses with his hands upon the lowest part of the abdomen

against its contents, and by appropriate manipulation gently urges these contents in the same direction as the gravitation. The assistant will see and feel the contents of the trunk recede under this procedure, and the degree of this effect increases at each repetition. This action may be repeated three or four times.

The reader will notice that the following series of mechanical effects have been described:

1. Expansion of the chest, without increase of its content of air.

2. Instant reversal of the direction of gravitation within the body.

3. The filling of the distended portion of the trunk and the shrinking of the inferior relaxed portion—the flattening of the abdomen.

4. The conjunction of these acts with the ordinary natural rhythm, which is converted into a pump-like act, by the fixation of the walls of the chest.

5. The furtherance of these effects to an extreme degree by the added manual force of the assistant.

6. In case of hernia, the manipulation may act directly on the hernial structures, as powerful local massage. In case of intrusion the wedged and deformed contents of the pelvis experience complete relief; they are moved upward.

7. The process described properly pursued removes the surplus fluids from the pelvic organs, and remedies congestion and its consequences.

The hips-lifting combined with pressure-stroking of the abdomen as above described, may be repeated three or four times, and the patient left undisturbed for several minutes.

PROCESS 26.

Apparatus and Assistant.—To combine the extreme effects of gravitation with muscular action, aided by reflex incitation.

The apparatus constructed to facilitate the correction of mal-position of the viscera or any portion thereof, consists of two parts, one of which is fixed, and upon this the patient rests, supported by his elbows, his arms being perpendicular to its well-padded surface. The rear part of the apparatus on which the trunk of the patient rests is movable; and by the action of a lever operated by the foot of an assistant, separates from the fixed portion by springing upwards and backwards, causing the patient's body to assume a diagonal direction. The elbows remaining stationary while the rest of the body moves a considerable distance, causes the arms to be quickly drawn upward parallel with the trunk, the mechanical action being similar to that shown in processes 1, 9, and others.

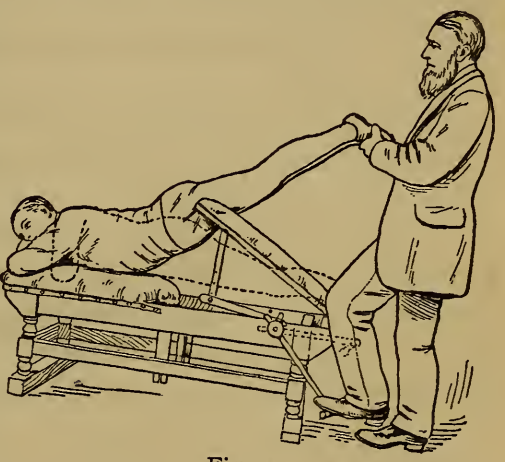

Fig. 24.

This action, like those referred to, separates the side-walls of the chest, distends the diaphragm and enormously increases the capacity of the chest and intermediary portion of the body, without giving the least occasion for increase of air in the chest. This space is therefore the receptacle of whatever may be urged into it from below.

The whole trunk has meantime changed from the horizontal to an inclined position, and its mobile contents are correspondingly changed in relation to the force of gravitation. This force now acts *from*, in place of *toward*, the pelvis, as in the erect position. If the visceral organs have a weight of fifteen pounds, this weight now recedes from, and draws after it, the contents of the pelvis.

The abdominal walls, being elastic and yielding to the

slightest force, the visceral contents fall into the pouch formed by the anterior wall of the abdomen in consequence of change of gravitation ; while the manifestation of muscular power by these walls, contracts the abdomen, diminishes the abdominal space, and urges the contents towards the diaphragm.

During this action the legs of the patient, being wrapped in a light covering, are steadied and so raised by the assistant as to accommodate the shifting position of the patient's body. He may also communicate a swaying or other motion to the pelvis through the legs or otherwise, to increase the effects of the process. After a momentary suspense in the oblique position of the trunk, the patient is permitted gradually to resume the commencing position. This process may be repeated three or four times, and should be followed by remaining, face downward, on the apparatus with the arms extended upward, so as to retain the mechanical effects acquired as long as possible.

In case of beginners and of helpless invalids, a second assistant is desirable. This assistant before commencing the lifting action, places one hand at the base of the abdomen, and the other at the back, so as to include the lower part of the body between his two hands ; and as the action proceeds, vigorous compression is thus applied to the included parts. This not only supplies confidence to the patient, but increases the lifting effect.

Effects.—1. By the sudden elevation and stretching upward of the arms, the chest walls are correspondingly broadened and elevated. The diaphragm assumes the mechanical functions of an immense piston acting with a vigorous upward stroke in the cylinder represented by the trunk. The area of this piston is equal to the area of the transverse section of the trunk. The force with which it works is the force imparted by the lever pressed down by the foot, transmitted through the arms of the patient which serve as levers, and

through the musculo-mechanical connections of the arms with the chest walls; to these walls and to the diaphragm, and thence to the abdominal and pelvic regions.

The mechanical chest and diaphragm movement described forces irresistibly upward the whole mass below, irrespective of the special form, quality, or function of these organic parts or their condition of health.

2. Gravitation suddenly reversed, merges with, and becomes auxiliary to the effect of the piston force. The effect of this addition from gravitation, is increased by the forward lying position, by the raising of the body, by the yielding elastic nature of the anterior wall of the abdomen; which, gravitating, forms a receptacle for the abdominal contents, and removes all obstacles to the full effect of this combination.

3. The direction in which the contents of the cavity are impelled by the act described very much favors the expenditure of the combined forces at the hernial border, and in the pelvis. The prolapsed rectum is instantly returned, even through the sphincter in active spasm; the contents of the pelvis, long deformed by malposition through prolonged uninterrupted pressure, are restored. This is most frequently and palpably demonstrated in the cure of retroflexion of the uterus.

4. The impulse communicated through the abdominal and pelvic contents is apparently capable of disengaging unseen, and unestimated mechanical obstacles, which may exist either as cause or consequence of the objective affection, such as flexure of the rectum, retroflexion of the uterus, compression of the bladder, etc.

The above effects are purely mechanical, and neither command nor depend on the vital properties of the object under treatment, and may be conceived as occurring in the same way in inanimate objects supplying the mechanical conditions. The muscles of the chest which distend it to its extreme

measure, are not in this process employed as muscles, but only as mechanical connections. Gravitation is extra vital; the abdominal and chest space are receptacles produced by the process, and are mechanical; the piston movement is mechanical, which, with the transverse diameter of the trunk and the mechanical force conveyed to it, supply data for mathematical calculation as to the power which the combined mechanical resources co-operating with atmospheric pressure, transmit to the hernial neck and the pelvic organs.

6. The reflex of the abdominal muscles incited by the application of the hand of the second operator is a vital property, and its influence greatly aids the redistribution of physiological energies, whose defect is the real source of the affection to be remedied. The incitation thus supplied concentres the energies of the system at the anterior muscles of the abdomen, which therefore becomes auxiliary to, and merges with, the natural rhythm, to restore it, and with it the local affection dependant thereon.

An approximate estimate of the amount of the mechanical force available at the superior plane of the pelvis is possible, and this may be helpful to inquirers who are disposed to unite the facts opposed to the ordinary empirical solutions of difficulties pertaining to the pelvic and hernial regions.

If a person weighing say one hundred and thirty pounds suspends himself by grasping a fixed object overhead, a considerable portion of his weight falls on the chest muscles, connecting the ribs with the arms. The proportion borne by them will, perhaps, be sixty pounds. It is obvious that the same chest distention would be produced by the same action when the position is reversed, as in the above and all similar processes. The force is brought to bear on the transverse section of the trunk, which hence becomes an imaginary piston, worked by the chest muscles, and actually moves upward in proportion to the power these muscles transmit.

In this position the force thus manifested is increased by

the weight of the abdominal contents, which are by the position made to bear in the same direction. If these contents should represent twenty pounds, scarcely less than ten are, by the means described, made to act toward the diaphragm and chest.

To this must be added both the whole force of the respiratory rhythm, now compelled to be exerted solely by the abdominal muscles with the little aid the diaphragm may afford: which, with the effects of reflex incitation, may be computed at ten pounds more, making in all eighty pounds, available at the upper transverse plane of the pelvis, to draw up its contents and to draw in hernial and rectal protrusion.

The increase of this force by the momentum produced by its sudden application apparently doubles the effect; and this effect is still further increased by a few repetitions of the process.

PROCESS 27.

One or two Assistants.—To raise the contents of the pelvis and related parts to the natural position, and to strengthen their support.

Position.—The patient stands, grasping a transverse fixed rod as high as he can conveniently reach. Standing behind him, an assistant places both hands on the convexity of the chest, each side the spine. Sitting on a stool before him the second assistant places both hands on the lowest part of the abdomen, just above the bone at its base.

Action.—The patient remains entirely passive while the assistant behind presses very strongly against the back of the chest, and urges forward the patient's body till it becomes considerably advanced and convex at its anterior outline. During the act, the assistant sitting in front, also presses with a little less force than the assistant behind, but not quite enough to prevent the forward bending of the patient's body.

When the body of the patient has acquired the extreme forward convexity, the relations of the two pressures applied by the two assistants must be reversed. The assistant in front now presses with most force, while the one behind gently and slowly yields, and allows the body of the patient to bend backward as it previously bent forward, till the body becomes straight as at the beginning. This forward and backward swaying motion with alternate reversal of pressure and action may be repeated four or five times.

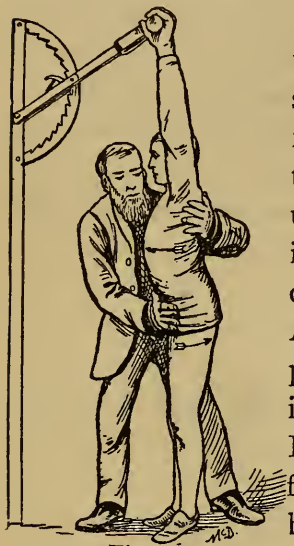

Fig. 25.

Effects.—The pressure upon the convexity of the chest causing the body to straighten, raises the forward ends of the ribs; this, as has been shown, increases the space the ribs include, and the measure and capacity of the chest; and the increase extends to the space below the diaphragm as a mechanical necessity. As this effect is entirely mechanical and passive it follows that the amount of air in the chest cannot be increased thereby. It contains only the same measure as before, but being more capacious, the space becomes filled entirely with the visceral organs which rise into the space thus produced. The whole visceral mass, without respect to mechanical form, anatomical structure, or physiological qualities and functions, rise alike. This mass includes parts in contact with the hernial tissues, and those contained by the pelvis. The strong pressure to the lower abdomen applied by the second assistant, is to afford the counter-pressure or resistance necessary to reverse the natural curves of the spine. This is required to raise the ribs and with them the diaphragm, which secures the upward suction or piston effect. The pressure applied at the point and in the direction described, merges with, and is therefore auxiliary to the

combined force of the chest muscles, producing distention of its space; and aids to the extent of the force thus directly applied, to raise the abdominal and pelvic contents. The process immediately produces sensible amelioration of all pelvic symptoms.

Modification.—This process may be applied by one assistant as shown by the cut, instead of two assistants, as in the above description. The assistant stands beside the patient, applies one hand to the back of the chest, the other to the lower abdomen, as indicated in the cut, and is careful to give the alternations of pressure as before described. This method is effective in case of thin and flexible invalids.

PROCESS 28.

One or two Assistants.—To produce effects similar to the above.

Position.—The patient stands grasping some firm object about three feet high, his feet resting on the floor so far back that the line of his body has a strong inclination forward; assistants standing at either side, place their hands upon the patient's back and abdomen.

Fig. 26.

Action.—The assistants compress the part of the patient's body included between their hands with such alternations of force as to bend it strongly forward and then backward, while the patient is unresisting. This may be repeated six or eight times.

Effects.—The alternating motion and pressure in the position described produces distinct upward traction from the pelvis and the hernial region, and increases the extension of

rhythm to these parts. These effects are the consequence of the fixation of the chest, and the necessary communication of rhythm to the abdomen, which is re-enforced by the reflex incitation, and by the direct compression afforded by the assistants.

This process may be applied by one assistant in place of two, as figured in the cut.

XVI.

Special Processes of Kneading and Massage.

The anatomical and physiological adaptations of the contents of the abdomen and pelvis to the gliding upon each other of their peritoneal surfaces, has been fully shown in preceding parts of this work; and the necessity of this motion, both rhythmic and as the incident and consequence of ordinary avocations, has been sufficiently explained. The therapeutic utility of submitting the mass included in the cavity of the trunk to process quite similar to the incidental natural process, is a proper, and indeed necessary inference.

The restoration of health, is simply reinstating suffering parts in their physiological adaptations; and involves compliance with physiological, that is, natural methods. The natural motions described, though incidental to all voluntary activities, are necessary to the function of the digestive and connected organs.

In all ill health connected with the pelvic contents and adjoining parts, the due motions are demonstrably under constraint, and often entirely absent. It is not necessary to wait for cultivation to restore the lost rhythm, and the power necessary for voluntary exercise. The effects desired may be secured by supplying the defect by art, directly to the suffering parts by means of immediate physical processes, included under the terms *kneading* and *massage*. These proc-

esses supply by direct means what has been denied by unhygienic neglect. Kneading and massage transmit motions to parts in which it is due, independent of the will of the individual. The effect therefore is localized so far as relates to the muscles, but is general, as relates to the aid afforded the circulation of the blood and other fluids, and remarkably so, as regards the nervous system.

PROCESS 29.

One or two Assistants.—To apply very slow massage to the abdomen, or kneading.

The readiest methods of applying kneading without the aid of apparatus are described in "Massage," pages 194 and 195. A more effective method, because engaging the manual strength of two assistants, is the following:

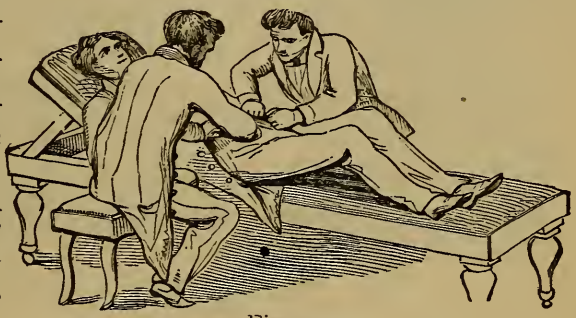

Fig. 27.

Position.—Reclining, the shoulders raised and the thighs slightly drawn up to relax as much as possible the abdominal coverings. An assistant is seated each side of the patient.

Action.—The assistant at one side, using both hands, which may be closed or not, firmly compresses the abdomen at right angles to its surface; and as he relaxes the compression, the assistant at the other side of the patient also makes compression in the same way. This alternate action on the abdomen by the two assistants may be continued rather slowly for several minutes.

Effects.—The kneading process causes the contents of the abdomen to recede on either side alternately, which necessarily causes the gliding of all the peritoneal surfaces, as far as the motion reaches.

It subjects the muscular portions of all the interior organs to such action as is the necessary condition for their nutrition and strength.

It urges forward by direct impulse, the blood in all the vessels distributed among the digestive organs. It therefore is a most important aid to the withdrawing of the circulation from the pelvic contents, and is essential for the effectual relief of congestion of any part of these organs.

It aids nutrition by promoting the flow of the contents of the lacteal vessels, and of the chyle ducts, which convey digested products into the circulation.

It is a most efficient means of promoting the peristaltic motion of the digestive tube, so necessary to remove constipation.

It promotes the absorption of digested matter from the interior of the digestive organs, by urging onward the flow of the absorbent veins and lacteals; and the residuals, which, by remaining motionless would impede further digestive action.

PROCESS 30.

Apparatus.—To urge into a higher position all the digestive organs and pelvic contents.

Position and Action.—The patient lies face downwards, on an apparatus having a well-padded top, adjustable as to height, having a central broad opening, into which falls the abdomen of the person lying face downward upon it.

Within this opening two wooden rollers are caused by mechanism below to revolve very slowly in a perpendicular orbit, and which at each revolution, engage with the soft, yielding abdomen into whose contact they come. The movable contents of the abdomen are thus urged toward the chest, as the loose contents of a sac might be transferred to one end by force applied along its exterior. This process may be continued ten minutes or more, according to the sensations.

Effects —1. All the muscles of the abdomen, irrespective of their relations or special uses, are subjected to an abundance of passive tension and relaxation with pressure, or massage. This insures their nutrition and promotes the return of their natural rhythm.

2. All the tendons, ligaments, aponeuroses, connective tissues, and other mechanical structures entering into the surgical anatomy of hernia, are worked upon, put to use,

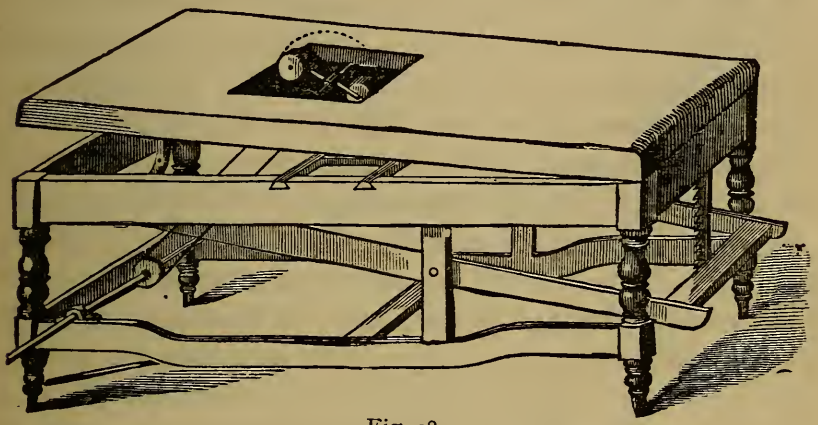

Fig. 28.

strengthened, toughened, and increased in resisting power. The hernial neck is obliterated by increase of local tissue.

3. In proportion as the contents of the abdomen are mechanically urged upward by the force applied to them, those below the abdomen, the contents of the pelvis, of necessity move in the same direction, as a stream of liquid below the piston of a pump, flows upward uninterruptedly as well as that above it.

4. The return or venous circulation is assisted in its course, compensating for previous and existing deficiencies. Pelvic hyperæmia and its consequences become mechanically removed, and the conditions for continued removal increase in power.

5. The position of the patient during the process fixes the side walls of the chest, preventing their participation in the

respiratory act. This act therefore transpires through the abdominal walls in place of the chest walls. This change, as has been shown, communicates the rhythm to the contents of the pelvis, and moves them upward. The respiratory movements and the exterior force transmitted by the apparatus, are auxiliary to each other, and greatly increase the mechanical effect desired of shifting upwards the contents of the abdomen and pelvis.

6. The position of the abdomen, unsupported and depending, contributes by its weight to the urging from, or traction of, the lower part of the digestive tube and the pelvic contents. The weight of the digestive organs is also an addition to the force applied by the apparatus, acting to remove protrusion and all inferior degrees of displacement.

7. In this process, as in many of the preceding, the force having its source in the apparatus, that having its source in natural involuntary rhythm, and that having its source in the will, unite in contributing to the same end, the restoration of rhythm and its wholesome, and, in the cases of local disease, curative effects. Other remedies do not have these important ends in view.

The invaluable aid to physiological action afforded by kneading the abdomen, admits of considerable variety in the modes of its application and of the apparatus for facilitating the process in different cases. The following are most frequently used:

PROCESS 31.

Apparatus.—To promote physiological processes, and develop muscular power in the visceral organs and the abdominal wall.

Position and Action.—The apparatus and its adjustments required are like that of process 30, except that one kneading ball is used, and the circle described by it is horizontal.

The action is in a circle, and includes the whole abdomen, into the soft substance of which the roller is depressed in its slow circuitous travel.

Effect.—These are similar to those described in 30, but probably has less lifting effect. It is equally as efficacious in assisting the local circulation and the development of

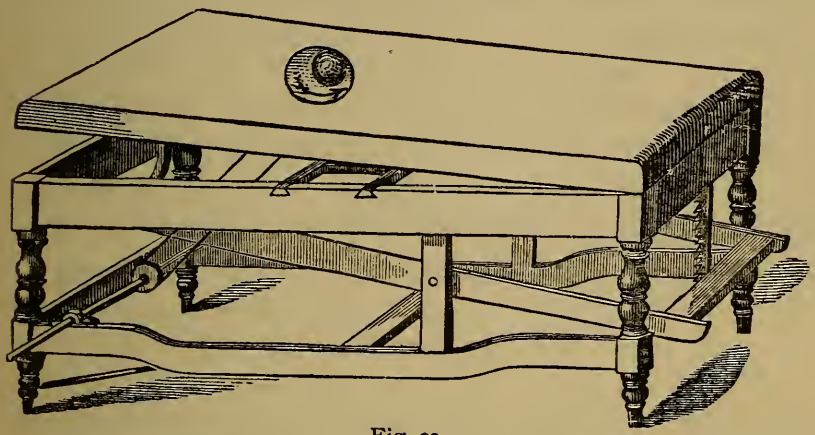

Fig. 29.

muscular action, peristaltic and rhythmic. It removes constipation of the bowels and weakness in general throughout the viscera.

PROCESS 32.

Apparatus.—To effect similar purposes, to harden the hernial tissues, and to close its canals.

Position and Action.—The apparatus resembles those above described in appearance and method of use. The rolling impingement upon the abdomen, is however replaced by the direct impingement of headed rods, moving in lines at right angles to the surface of the abdomen, alternately at its two sides.

The action and effects of this process are similar to process 28. It affords these advantages:

1. The position and action together cause the viscera to recede from the pelvis, instead of being crowded into it.

2. The action is controlled by the patient.

3. Since every upward impulse communicated by the mechanism is followed by gravitation downward, the effect is doubled by the face-downward position.

Effects.—These are similar to those above described. The action is however much deeper, effectually reaching the interior of the viscera. It is also, as localized as may be desired for any special purpose. It is often applied directly to the hernial canal, and is very efficient in the aid it affords in securing the development and resisting power of the local hernial tissues, and useful in closing the hernial opening.

PROCESS 33.

Apparatus.—To urge forward the contents of the venous and lacteal vessels, promote local muscular nutrition, and diminish compression of the herniary tissues and pelvic contents.

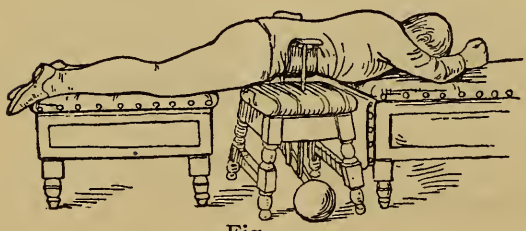

Fig. 30.

Position and Action.—The patient lies face downward across a padded belt in which the abdomen is suspended. The two ends of the belt which half enclose the body, receive a reciprocating motion by appropriate application of power which may be by the foot, balanced by a weight. The motion of this belt pad carries with it that portion of the abdomen which is pressed upon and therefore adheres to it. The reciprocating motion may be continued several minutes.

Effects.—The process described combines massage with kneading. It produces inter-fibre and inter-molecular friction,

or motion with pressure, which is the essential effect of massage however applied—with the gliding of parts of organs covered with serous membrane upon each other, which is the prominent effect of kneading processes.

The effect is largely expended in the walls of the abdomen, whose tissues are increased, hardened; and whose rhythmic function is promoted by the processes.

XVII.

Processes of Very Quick Massage, or Rubbing.

PROCESS 34.

Apparatus.—To apply localized mechanical massage direct to the defective parts.

Position and Action.—The apparatus consists of a rubbing pad, made of pieces of rubber fastened together, attached to a shank, presenting very soft, flexible ends; the person sitting or standing, applies some portion of the body to this pad, which is given a rapid reciprocating motion by means of appropriate mechanism. The pad is adjustable while in motion to any part of the body, from head to feet.

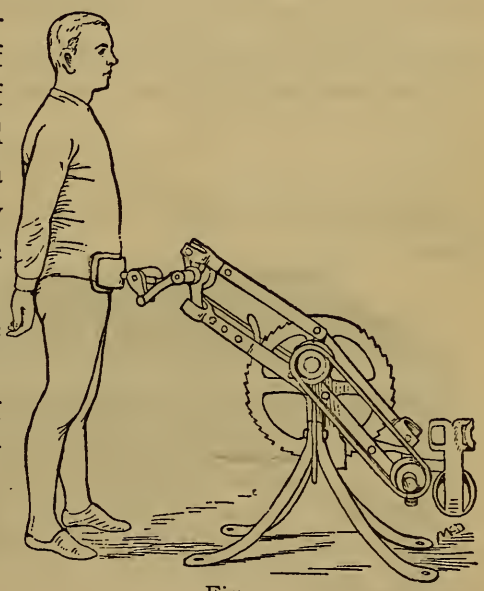

Fig. 31.

Effects.—In mechanical massage, one function of the rubbing pad in contact with any part of the person of the patient is to replace the action of the hand of the assistant.

In cases of pelvic affection the process is applied to the

thighs, hips and anterior portion of the abdominal wall. It causes the part receiving the greatest degree of motion, to become thoroughly reddened by the increase of blood; and is hence a most valuable means of unloading the interior pelvic organs, and of causing their net-work of capillaries to contract, and urge forward their contents. It is a valuable remedy in congestion of any part, applied as in case of the pelvic contents, at a little distance from the seat of the affection.

In hernia, the pad in motion is applied direct to the weak tissues. It strengthens and hardens these tissues, causes absorption of adventitious, fatty, and watery material, and the substitution of the contractile and resisting structures, which naturally belong in the location.

The use of this application quickly remedies the ill effects certain to be produced by the wearing of trusses and other instruments intended to afford mechanical support. The absorbed structures consequent upon the pressure, are replaced by the nutritive incitation produced by the process described.

PROCESS 35.

Apparatus.—To secure the same effects in the lying position.

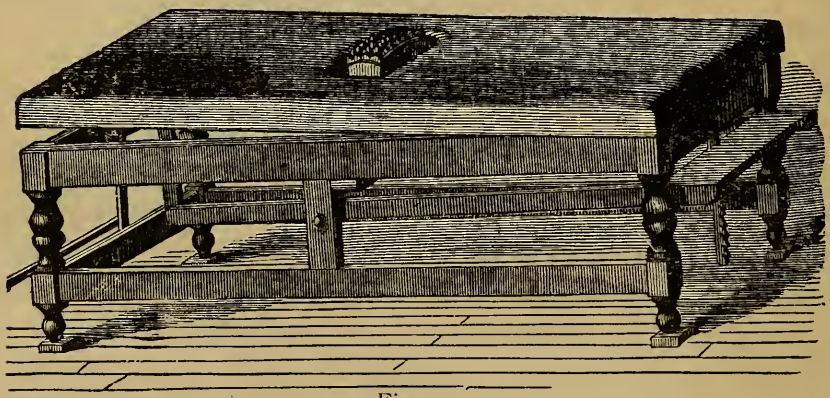

Fig. 32.

Position, Action and Effects.—The patient is exposed to the action of a rapidly reciprocating rubbing pad, which operates

through an opening in the padded top of the apparatus on which he reclines. The degree of pressure is regulated by a ratchet which controls the weight with which the body rests upon the acting pad, and is under the entire control of the patient who regulates it to suit his feelings. By moving and adjusting his body, the patient brings the part where the effect is desired into contact with the pad.

Similar effects are derived from the action of this apparatus, as from process 34. In the latter case the massage is applied across the body, while in the former it is applied in the longitudinal direction of the muscles. In process 35 the patient is in the lying position, which renders the process adapted to the feeblest invalid.

PROCESS 36.

Auto-Vibration.—To secure similar effects without the assistance of mechanism.

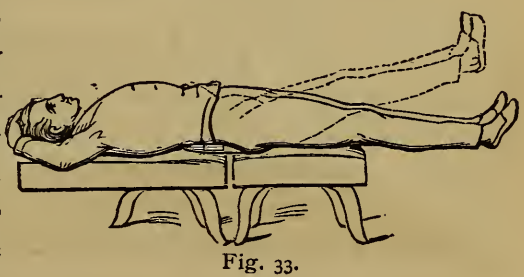

Fig. 33.

The effects of mechanical vibration may be approximately produced by manual methods. The manual process, as relates to the contents of the trunk, is best applied by first securing *tension* of the coverings of the organs in which the effect is desired. For the contents of the abdomen the abdominal wall needs to be in a state of contraction. The modes of obtaining this preliminary condition will differ with different parts in which its effects is desired.

Position.—Lying on the back, the legs slightly raised, as shown in the cut. The arms and hands are free.

Action.—With one or both hands, light, rapid percussive strokes are applied to the abdomen, or such part of it as

covers the organ through which it is desired the vibratory waves should pass.

Effects.—The raised position of the legs is accompanied by strain or tension of the abdominal muscles; also of interior lifting muscles. The effect of the latter is to push upwards the contents of the pelvis. The rapid impingement of the patient's hands on the tense coverings of the abdomen causes a vibratory thrill to penetrate through the visceral mass, the intensity of which shades off in all directions. The vibration urges forward the contents of the congested or hyperæmic vessels, and at the same time incites contraction of their walls, induces normal permanent contractility, and diffuses the circulation; and is conducive to the remedying of local inflammation of every degree.

Modification 1.—Similar tension of the anterior portion of trunk may be produced by simply bending to one side or backward, in either the standing, kneeling, or sitting position. The percussive action is applied to the convexity, this being the tense part.

Modification 2.—Tension of the abdomen may also be produced by deeply inflating the chest, and holding the breath; in connection with urging into the abdomen the increased volume. Increased tension of the abdominal coverings is secured by combining inflation with bending. Percussion is applied as before to the tense part.

XVIII.

Massage of the Extremities.

For description of processes and effects of *manual* massage of the limbs, the reader is referred to the author's work entitled "Massage." The nature, form, and effects of *mechanical* massage, may be here represented.

PROCESS 37.

Massage of Arms.—Apparatus, operated by an assistant or by other power.

Position.—The patient sits convenient to the apparatus and extends one arm horizontally between its two parallel, exceedingly soft and elastic pads; the other hand is placed upon a lever, pressure upon which causes the pads to approach each other, and consequently to press upon the two sides of the included arm in proportion as the patient bears upon the lever. In the absence of pressure upon the lever the arm is free; the patient instinctively controls the effect by controlling the pressure.

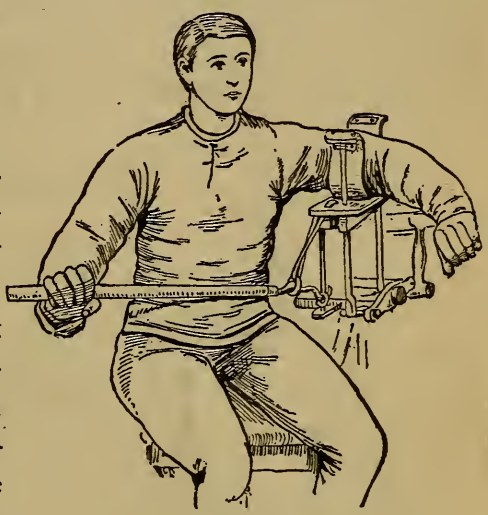

Fig. 34.

The two pads being set in rapid reciprocating action by the mechanism with which they are connected, the flesh of the arm is subjected to action, just in proportion as the pressure is applied to the lever; this motion, and consequently its effects, is wholly under the control of the one receiving it; and is therefore strictly in accordance with his feelings.

The arm may be caused to advance or retreat between the pads in motion, so as to include the shoulder, the fingers and intervening parts; and the action may continue several minutes.

To apply the process to the other arm, the patient may simply turn in his seat so as to face in the opposite direction; or he may change his seat to the opposite side of the apparatus.

Effects.—The first and most noticeable is the sensation of heat. The motion transmitted is in part resolved into its correlated form of energy, and heat becomes conspicuous, affecting both the sensations and the thermometer. An inanimate object of similar physical constitution would become quickly heated from friction such as occurs between the cells, fibres, molecules and membranes, of which the limb is composed. Other effects, as aid to the circulation in obstructed vessels imparted by the mechanical impulse; rapid chemical changes, especially oxidation, and further important effects are discussed in "Massage." The process is of immediate service in causing blood to flow *from* the head.

PROCESS 38.

Fig. 35.

Massage of Legs.—Apparatus, operated by an assistant or other power.

Position.—The legs may be included between the pads of the same apparatus, and receive the same action, by lowering it to a convenient position by means of a ratchet, adapted to that purpose.

For the better convenience of the lower extremities, an apparatus may be used which includes the rubbing pads, connected with a support on which the legs and body may rest while the leg is being submitted to the action of the pads. The patient sits so that the portion of the leg next the body is included between the pads. The body is made to recede, so as to subject each portion of the

leg successively to the action of the pads, as slowly as may be desired. The degree of the action, or the pressure through which the motion becomes operative, is controlled by a lever which is immediately accessible to the hand of the patient. A small weight is sometimes used on the lever to facilitate the control of the action of the apparatus. The two legs are submitted in turn to the process.

Effects.—These consist of large contributions of heat, produced as in health, in the vital system; any deficiency of which is immediately supplied. The most inveterately cold feet become warm, and the conditions for self-supply of heat are improved. Revulsion, or the transfer of blood from the remainder of the body to the parts subjected to the massage, is another often extremely desirable effect, quite certain to be produced by the action.

PROCESSES 39 AND 40.

Oscillation: Oscillatory Massage of the Limbs—Apparatus.—This form of massage differs from those described in processes 34 to 38, in that no separate arrangement for pressure derived either from the weight of the body, or through a lever, is required. The effect depends on two other coincident facts; one is that of sudden change of motion; and the other is the compression produced by the rapid slight partial twisting and untwisting of the longitudinal fibres of the limbs.

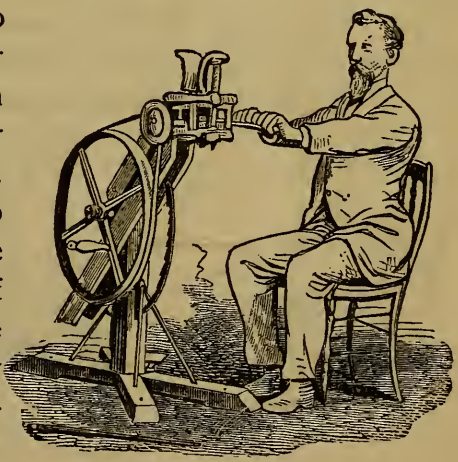

Fig. 36.

Position.—For the leg, the foot is placed in a holder, capa-

ble of receiving, holding and liberating it at will; this is at the end of a rocking shaft, and in, or near the axis of motion of the shaft.

For the arm, a convenient handle for the hand to firmly grasp, is all that is necessary. One or both hands may grasp the handle at the same time.

When the shaft and foot are set in oscillation, the leg is caused slightly to turn on its axis, the motion terminating only at the hip joint, the muscles surrounding which are set in vigorous action, which effect is participated in by the flesh of the whole limb. This alternate turning from side to side, or oscillation may be continued for several minutes, and from it the following consequences ensue:

1. A large amount of heat appears; in general the leg becomes pleasantly heated throughout. This heat becomes diffused throughout the body, doubtless in consequence of its transportation by means of the circulation; the successive portions of blood passing through the leg become charged with its increased heat, and are distributed throughout the body.

The heat thus rendered conspicuous to the senses, is doubtless derived from two sources. One is the transformation of motion to heat, consequent upon the friction of the minute anatomical constituents of the limb. This is largely increased by sudden changes of direction of the motion. At the end of each short excursion of the limb, momentum is acquired, which is resolved into heat at the instant of the change of direction of the motion.

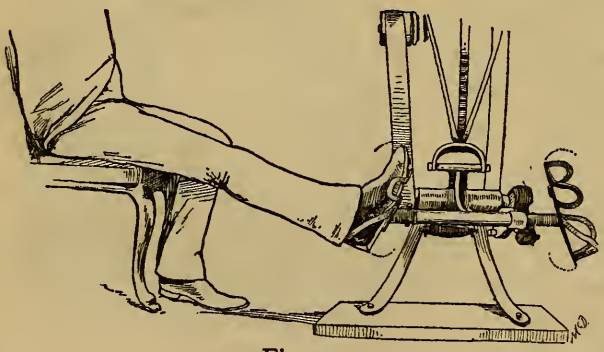

Fig. 37.

And as the motion and changes are rapid, a large amount of the mechanical energy employed is thus consumed, being resolved into heat.

2. The evidences of increased oxidation are indisputable. The effect is shown by an increase of urine, increase of transpiration, and increase of respiration. These very conspicuous effects are the consequences of destruction of *sub oxides;* matters no longer useful to vitality except as a source of heat by their oxidation. A large elimination of waste matter is rapidly secured by this form of massage.

3. More immediately connected with affections of the pelvic contents, and the congestion or hyperæmia with which these affections are associated, is the effect of producing an improved distribution of the circulation. The increase of local heat in the legs, is accompanied by an increase of the amount of blood the legs contain. This fact is made apparent by every test. The increase of the amount of blood in the limbs is immediately connected with its decrease at all parts from which the fluid may be supplied, notably the pelvis which is nearest, and whose supply is most abundant and easily parted with. The process described naturally aids the reduction of the pelvic hyperæmia or congestion; and increasing the capacity of the limbs for increased supplies of blood results in restoration of balance to the circulation, and therefore in permanent advantage to the pelvis.

4. The small muscles about the thigh receive the motion transmitted through the legs in a somewhat different form. As most of these muscles deviate from the line of the axis of motion, it follows that the motion they receive consists largely of rapid distention and relaxation. This form of motion unequivocally develops their nutritive activity and power. These muscles are in immediate mechanical as well as functional relations with the pelvis; their action when caused by communicated motion as in oscillating massage, superin-

duces contraction of the pelvic contents, somewhat similar to that produced by voluntary resisted twisting of the legs, previously described.

At the same instant the incitation of the tissues of the legs, causes them to receive and to retain an increased supply of blood in the acting muscles. These two facts conjoin in effecting a redistribution of the blood exceedingly salutary in pelvic affections in all their varieties.

The processes of oscillating massage, produces a peculiar effect on the nervous system, eminently desirable in pelvic, complicated with nervous affections. A tendency to quietude and even to sleepiness soon supervenes, even with the first application of the process. This probably is the consequence of the revulsion or transfer of blood from regions where it is in excess, as affecting the brain and spinal cord. It distinctly removes the hyperæmia, or excess of blood in these important organs, as from the pelvis.

Relations of Manual and Mechanical Massage.—As the question of the relations and comparative value of manual and mechanical massage frequently arises, it is proper that a few statements regarding the peculiarities of the two forms should be here made, to enable the reader to judge for himself. The purpose of the two are mainly the same. The manual form has the advantage of the intimate personal presence of the assistant, the warmth of his hand, and unlimited adjustability to the person of the invalid, whatever his position or degree of feebleness. On the other hand, the mechanical methods present the following advantages :—

1. The mechanical pad is under the absolute control of the patient, however feeble. He adjusts himself to its action almost instinctively, and its action is therefore never otherwise than agreeable, for the least approach of undesirable sensations causes the patient to desist. The slightest change of his position, changes the action and therefore his feelings.

The patient has no similar control of the action communicated by the assistant; he submits whether it is disagreeable or otherwise.

2. The expenditure of energy in mechanical massage serves almost wholly to promote nutritive effects in the muscular masses; the consequence of this is to counteract excessive nervous manifestations. This effect is secured by the compression of the pad which therefore does not traverse the nerve endings in the skin, and does not incite nerve-action and nerve-nutrition.

Mechanical massage therefore causes the muscular action and power to increase, and the excitability of the nerves to diminish.

The assistant of manual massage *may* produce similar effects in less degree, but by carelessness or ignorance often produces effects exactly opposite.

3. The power of mechanical massage is practically unlimited; the patient is never depressed by a sense of the fatigue of the assistant or operator, as is liable to be the case when the process is applied by a faithful assistant of limited power. The capacity of an ordinary invalid to *receive* communicated energy is many fold that which any assistant can *give*, especially if the rapid and stimulating kind is attempted.

4. The rate of motion the hand is capable of transmitting is comparatively limited, and can hardly practically reach two hundred changes of motion per minute; and this rate and indeed any rate cannot be long continued. The usual rate of mechanical massage is between one thousand and one thousand five hundred per minute. It follows that therapeutic effects of higher order and practically most desirable are connected in the higher rates of motion communicated by the unlimited resources of mechanical massage. Some of them may be briefly enumerated:—

(1.) *Heat.*—The hand of the assistant imparts heat, and

feebly increases its development in the tissues. Mechanical massage develops heat in the tissues in liberal abundance, even in the most feeble and frigid invalid. The transformation of motor-energy to heat energy among the vital tissues, is independent of vital action, but is practically of greatest utility; for the tissues appear to acquire the power thereby of spontaneously producing the desired increase of heat.

(2.) *Defective oxidation* is a constant feature of chronic invalidism, especially those forms manifesting specially in the pelvis; the local symptoms are in part due to the presence of excess of sub-oxides in the system at large, finding in the pelvis "a local habitation and a name." The evidences of increase of oxidation and diminution of sub-oxides, which of course diminish the embarrassments of pelvic disease, consist in increase of quantity and improved quality of the urine, increased transpiration, improved complexion, etc., which rapidly follow mechanical massage.

(3.) *Specific relations to the nerves.*—The power of manual massage to suspend local pain has been utilized from time immemorial in an empirical way. This effect of the hand does not approach that of mechanical massage. There is nothing equivocal or dubious about this effect, and scarcely any respecting the scientific explanation of the fact. This matter has been considerably discussed in the medical journals within a few years; the author however reserves his statement of the therapeutic relations of mechanical massage to the nervous system for another occasion.

PART III.

PRACTICE.

XIX.

Hernia. Self-Cure. Practical Examples.

In every case of hernia there has of necessity been a stage in which the affection, though not exteriorly manifest, yet potentially exists, in physiological defects—its conditions. The progress of the descent of the hernial loop is at any point easily arrested, by the action of the natural mechanism of sustentation. After the affection has reached a visible stage, the suitable processes adapted to bring the natural mechanism into play are very easily self-applied by any one who has even a small amount of strength and knows how to direct it. Hernia, and even some of the affections of the pelvic contents, afford little or no annoyance in subjects absolutely prostrate in strength. This shows that the true physiological remedy acts in opposition to gravitation. There can be no remedial value in merely hindering gravitating force, or in obscuring its effects. The proper remedy consists in opposing sufficient mechanico-physiological force to annul that of gravitation, however manifested at the base of the abdomen. The mechanism of the organism is so contrived as to favor this effect; intelligence respecting the principles involved appears to be desideratum.

The subject for hernia is frequently forewarned of the fact by an uneasy feeling, sometimes amounting to pain at some point in the hernial region. Such sensations denote persist-

ent pressure due to impingement of viscera at the spot thus indicated, a symptom which need not be allowed to continue. It is easily removed by such of the processes described in Part II. as cause the digestive organs to retire from interior contact with the suffering point. The processes which procure change in the direction of gravitation will generally be found to afford relief; these, however, should be followed by those capable of lifting, as described in the preceding portions of this work.

It is a popular but incorrect notion that hernia usually results from severe strains, as in lifting. If there be instances of this kind, it is because the mechanism of the act fails to be physiologically correlated; and the hernia was therefore potential, before the event causing its appearance. I have never happened to see a case in which the patient was able to connect the manifestation with any particular act of the sort. The physiology of lifting is certainly opposed to the supposition, for as a necessary preliminary to any effort of the kind, the contents of the abdomen are first drawn in and up in proportion to the expected effort. It is therefore wrong for subjects of protrusion to avoid this form of effort. In any case, the hernied person can easily understand that hernia in any stage is remedied by effort, call it lifting if you will—provided it be directed in lines of action *opposed* to the descent of the protrusion.

The majority of cases of hernia are doubtless remediable by the patient's own endeavors. By the term remedy, the full import of the word is meant; not palliation or concealment by a truss or any device whatever, but the complete, entire removal of the protrusion from the ruptured abdominal wall, together with all tendency thereto and all causes thereof.

The feasibility of self-remedy for hernia is unquestionable in the incipient stages of the affection; demonstrable in the early stages of protrusion, and in even old cases of small hernias. When the protrusion has acquired large size, when it

becomes strangulated, and when serious injury has been inflicted on the muscles, and on the local tissues at the point of rupture by prolonged use of the truss, intelligent assistance is desirable. The probability of self-cure may then be stated as the ratio between the local impediments, and the patient's physical powers and his intelligence in directing these powers to the desired end.

The principal conditions are not difficult to comply with; and may be stated as follows :—

1. The knowledge on the part of the sufferer that the exterior manifestation, and even the interior incipient symptoms, are not the principal matter to which attention is due; that such attention is mainly misapplied.

2. The knowledge that remedial processes are due to parts far above the manifestation, and consist not in the introduction of any new purpose, idea, or even process; but essentially in strengthening and fructifying the already existing provisions and actions, incorporated in the organic mechanism from its beginning.

3. A willingness, amounting to desire, to *specialize* his energies (no matter if these be restricted), in aid of the particular purpose in view.

4. In some cases a willingness to forego such personal habits as are incompatible with the end sought.

For example, if the patient is a full-bodied person, it is plain that little progress can be made in drawing up and in the protrusion, if the abdomen is kept too full to allow room inside its walls for the return of the protruded parts.

If he be an inert person he must take such personal interest in his own well being as to appropriate a stated portion of each day to processes necessary to fructify the defective parts, and to allow nothing to postpone the execution of this purpose.

If he be an over busy and active person, he must, though in opposition to his habits, take a season for the repose incident to the proper use of the special processes.

To show that the self-cure of hernia under the easy conditions above stated, is not an unprovable and unjustifiable statement a few examples are given below in which perfect and permanent self-restoration has been effected. Such circumstantial detail of the methods and processes are also given as will enable the reader, if he chances to be a sufferer in any similar way, to verify in his own person the principles through which the effects were secured. The following are average examples.

A young gentleman of about twenty-three, student of medicine in New York, where he resides, came to me for advice and directions after having worn a truss to cover the protrusion of a small direct inguinal hernia for the past seven months. He had meantime frequently tried to discontinue the instrument, but became satisfied that it was impossible to do so. The protrusion appeared the moment the truss was removed.

The young man was led to seek my advice and directions by the example of his sister, who, a few months previous, had been restored under my directions from a severe and hitherto intractable uterine affection, accompanied by melancholia. The philosophical student, who had closely watched the progress of the cure of his sister and witnessed the direct relevancy of the processes to the undisputed pelvic affection, desired to test the correctness of the claim of analogy and probable identity so far as relates to the sources of the two forms of manifestation.

The subject of this sketch was advised that he was probably a proper subject for self-cure; and that it would not be in the least necessary or desirable that he should absent himself from the regular course of lectures he was pursuing at —— Medical College. He was accordingly instructed in the following processes to be employed in the order given, and to strictly obey the injunctions and rules found on preceding

pages, which were stated to him as conditions for rendering the processes efficacious.

1. Process 1.
2. " 14.
3. " 7.
4. Process 22.
5. " 11.

He was directed to execute the above processes morning and night, appropriating such portion of his time as would secure him from interruption. He was also directed to abandon his truss at the end of one week and to report his progress to me in three or four weeks, or earlier, if he should meet with the least difficulty in fully securing his object.

This report was however deferred seven weeks. His self-treatment had in all respects progressed and concluded satisfactorily. He experienced not the least inconvenience in leaving off the truss, it had become entirely supererogatory. Before the end of the first week he had tested the reality of his apparent improvement. He tried by coughing, straining, etc., to produce a reappearance of the protrusion, or at least some indications of the point which it previously occupied, but without success. The hernial region at the time of this report had become perfectly strong, and forbid all apprehension of want of permanency. His father, a well-known official of high rank, had worn a truss from early years.

The truss should not be continued by one having recourse to the processes herein described after they begin to have effect, which means when the patient can successfully direct his voluntary energies to the points indicated by the processes. The use of the apparatus after this is injurious. One difficulty nearly always encountered is the force of habit, and the belief that protection is really afforded by the instrument. This often superinduces a baseless terror of discarding it, which can be removed only by being gradually displaced by new experience.

ACUTE STRANGULATED HERNIA.

Successful self-treatment of hernial protrusions is by no means confined to chronic cases. These have an advantage only in the fact that time has afforded opportunity for a deliberate understanding of the principles of action which may be employed at leisure and afford an assured certainty of benefit. The sudden appearance of hernial protrusion has the disadvantage of being an emergency for which the sufferer is not prepared; and is therefore liable to be mentally rather than physically incompetent for the self-management of his case. The perfect control of the affection is not in its nature beyond his reach. This will be shown in the following example. Assistance is usually required, but if the assistant possesses an intelligent apprehension of the principles which have been elucidated in the foregoing pages, it is by no means necessary that he be a physician. The following account indicates what procedures are necessary in a sudden emergency of protrusion with strangulation.

An engineer employed at a neighboring establishment having suffered several hours from what was supposed to be ordinary colic, was sent to my office a few rods distant for a prescription. He entered, crouching under intense abdominal pain associated with nausea, further indicated by beads of sweat on his face and the pallor of his countenance. Inquiry soon elicited the statement that a large "lump" had appeared a few hours before at the lower part of his abdomen. Exposure revealed a tumor of the size of a hen's egg or larger, of very irregular contour, which proved to be a femoral hernia. It was too sensitive to allow of the least examination by the touch. It also proved to be completely strangulated.

The patient was laid on the floor flat upon his back. A large piece of ice, protected by a towel, was placed in his hands, and he was required to hold it in direct contact with

the protrusion. In about fifteen minutes the supersensitive region had become perfectly benumbed from the effects of the cold. He now bore further examination without difficulty, under the anæsthetic of local cold. The tumor was found to be unyielding at the neck, and judging from appearances, the circulation of blood within it was entirely obstructed.

The patient's hands were now clasped upon his crown and he was directed to press hard upon his head, without altering the position of his hands. His feet were drawn up as near his body as possible, his hips were raised by substantial supports fifteen to twenty inches, the shoulders and feet remaining on the floor. The position was similar to that represented by Fig. 22, except that his hips were supported. Gentle and entirely painless taxis was now applied at the *base* of the tumor, not with inward pressure upon it, but with the purpose of liberating the constricted neck, at each point in its circumference successively. At the same time the two hands of an assistant were employed to compress the abdomen, the compression acting toward the diaphragm with an intermitting pressure. The weight of the contents of the abdomen, in the position described, acted in the same direction as the pressure; of course the natural gravitation and the applied force became auxiliary to each other, both tending toward the upper part of the trunk. The traction thus afforded was distinctly felt by the operator's fingers in contact with the point of constriction as intermittently applied. The incarcerated intestine was being liberated by traction supplied from *within* the abdomen, and no pushing or compelling force was applied from *without.* After a little gentle persuasive force the protrusion gradually receded, and in a few moments, wholly disappeared, leaving the tense Poupart's ligament under which it receded as distinctly to be felt as though exposed by the scalpel.

Now came the test and confirmation of faith in well-

founded principles. Should or should not a truss now be applied? Decidedly not. For it is impossible for the truss to reach, mechanically or physiologically, the source of the affection which exists less in the protrusion than in defective sustentation; nor can it supply the force required to remove the protrusion regarded as an interior difficulty; nor assist to develop the substance and power of the local tissues involved; but on the contrary it would certainly hinder and not help to strengthen the local difficulty; neither would the truss be useful for the immediate purpose of retention which legitimately operates from above, and not below the assailable point. Permanent and radical cure demands what is exactly opposed to all the effects of the truss. A reliable remedy demands the removal of the special weakness through which the hernia becomes possible; and through which also its existence may be indefinitely continued.

After a half hour's rest but little local soreness or even uneasiness remained at the seat of the protrusion, or indeed, anywhere. He was then, before rising from the floor, instructed in the following self-applied processes—several minutes to intervene between the execution of each.

1. Process 23.
2. " 1.
3. " 14.
4. Process 22.
5. " 20.

The patient was now allowed to proceed to his work. He was directed, however, to take the time to repeat the processes several times in the course of the day. He was called upon the next day and was found attending to his regular daily duties. For safety, he was instructed in a few additional self-applied processes described in Part II., to add to the variety and efficacy of their strengthening effects.

At this writing two years have elapsed since the event narrated; and the subject of it has meantime experienced no intimation of the least weakness of the hernial region, and

he had no other remedy than that stated. He continued to practise the processes for a few days only.

In closing this narrative a few words of comparison of the results with those usually attained, the best expected, will not be inappropriate. The first thing resorted to is *taxis*. To render this possible the patient must be made oblivious by drugs capable of producing that effect. The low vitality of the strangulated part, is thereby still further enfeebled ; it is incapable of resisting the mechanical rough usage, without serious, perhaps fatal, damage. If the portion of intestine subjected to the injury recovers after its return to the abdomen, a truss is applied and kept in place indefinitely, effectually preventing any healing of the rent in the abdominal wall. If taxis proves to be ineffective, the only alternative consists in the enlargement of the hernial opening, to allow the swollen extruded part to return. It is then prevented from reappearing by continued application of the truss pad. Gangrene and a fatal issue, is, in either case, strongly threatened.

SELF-CURE OF HERNIA COMPLICATED WITH OLD ADHESIONS AND WITH UTERINE HÆMORRHAGES.

The efficacy of self-treatment of hernia is by no means confined to men who are accustomed to muscular activity, and may in general be presumed to have good general muscular power, whatever may be the extent of the particular and local defect. Women may also cure themselves of hernia, even of long standing, as is shown in the following account :

The reader's attention is particularly called to the evidence afforded in the subjoined case that pelvic and hernial affections are products of the same ultimate causes, notwithstanding the apparent difference in the manifestation.

The conclusions derived from physiological and from mechanical considerations are completely confirmed by their

therapeutic application. The diseases usually regarded as widely different, are thus, incontestably proved to have a common source and a common remedy.

Mrs. N., a widow about forty years of age, called on me in passing through New York, on her way to her home in Rhode Island, after having spent nearly a year seeking health at a sanatorium in a neighboring state. She desired palliation for menorrhagia, till she could at some subsequent time come under my care. As the interview was necessarily limited by the near departure of her train, a proper examination was forbidden. She casually intimated that a hernial affection, for which she had constantly worn a truss for twenty years, might be an obstacle to the use of the remedial method I proposed. She expected always to wear the truss. I suggested the probability of enabling her to discontinue it by showing her such self-applied processes as would obviate its need. She was accordingly duly instructed in the proper mode of executing the following processes, to be found in Part II.

1. Process 1. 3. Process 21.
2. " 14. 4. " 13.

The first three secured to her the extension of rhythm to the pelvic contents, the raising of these contents, and the abatement of pelvic hyperæmia, effects to be secured in no other than some equivalent way, whether spontaneous, accidental or prescribed ; while the fourth would have the effect of mechanically filling the tissues of the periphery with the fluids of the body, and so diminish local pelvic excess of blood.

She was instructed to practice these processes twice daily, irrespective of her feelings, to observe always the proper slowness and rapidity of execution, and not to forget the interval of profound quiet; to discard the truss as soon as she found by experiment that she could do without it; that the wearing of the instrument during the execution of the proc-

ess was not a serious drawback upon these effects, as it practically ceased to afford compression at this time; and to write to me of her progress in three weeks; and, if proper, additions would be made to her prescription.

Finding, from her report at the time designated, that she had been unusually faithful in carrying out the principles, I described to her by letter the following additions to the processes previously employed.

5. Process 22.
6. " 23.

This lady was next heard from in about six weeks, when she stated that she had become *entirely emancipated from the truss*, and that her pelvic difficulty was entirely in abeyance, and she believed was permanently removed.

Not the least instructive portion of this account is what follows, as it asserts the power of the remedy in irreducible hernia. Several months after the above events this lady presented herself at my office with her son, whose benefit she now sought, and whose case being entirely foreign to the present object, need not be further mentioned. Being necessarily present to care for a feeble invalid, she took occasion to pursue further treatment in its assisted forms which the reader has already learned is, if desirable, made far more searching than the single processes, while superseding the need of effort or the use of the will. In a few days after the beginning of the new course, she began to feel serious uneasiness at the old seat of hernia, which for a short period daily increased. A feeling of distrust apparently arose in her mind, for without consultation she resumed the some time discarded truss. As this recourse appeared to afford no relief, her trouble was at last confessed, and the instrument again thrown aside, this time permanently. No exterior evidences of protrusion were apparent; the local tissues had recovered strength; the pain gradually diminished, and in a few days disappeared and did not return.

As similar occurrences of rise and subsidence of local pain in the hernial vicinity have several times occurred in cases of perfectly successful self-treatment, it is due that the apprehension which might be felt as to its meaning should be allayed by its rational explanation. Being misunderstood, the intervention of unusual sensations might prevent the pursuit of a perfectly correct course of treatment, and therefore prevent recoveries easily within reach.

In the present instance, the more vigorous upward impulsion of the abdominal contents (and the pelvic and hernial with them) secured by the additional facilities, revealed adhesions in the immediate vicinity of the inner hernial opening. The adhering parts become strained, and the cementing bands become stretched. The mechanical consequence is, a tendency to the resumption of the motions of rhythm, and a gliding of contact—surfaces. The necessary effect is gradual, progressive, but not always entirely painless, divulsion.

The loop of intestine or omentum which may have been long fixed and immovable by adhering bands, and the adherent peritoneal surfaces were enabled again to glide smoothly and naturally upon each other, at the point previously agglutinated. The probability of any recurrence of the affection is in this way positively precluded; for hernia is mechanically impossible where the omental or intestinal loop is not persistently urged against the same defective point of the abdominal wall. The mechanical gliding of the opposing parts is imcompatible with protrusion, and this is secured through natural rhythm.

This explanation of the mode of removing the adhesions which render hernia irreducible, is supported and confined by analogy. For the chest walls not unfrequently adhere to the lungs by the same adhesion of serous surfaces. These adhesions have often been made to gradually yield by inducing motion of the walls of the chest in a way perfectly analogous to that employed for peritoneal adhesions, and with the same

results, which in the latter case are clear and unequivocal to the senses of the competent diagnostician.

This result is secured by causing absorption of feebly vitalized substance under the effects of inter-molecular motion and the motion of masses, and it is far from being a surgical, or even a painful operation.

In the present case no abatement or even change of mechanical forms of processes were required, and the annoyance completely and permanently disappeared in one or two weeks. Two years have elapsed and there has been no recurrence of the old difficulties.

Hernia with Constipation.—The identity of the ultimate source of hernia with other morbid manifestations of the pelvic contents, is easily and satisfactorily proved in therapeutic experience, whenever such experience is directed to the sources rather than the effects ; to the causative, in distinction from the consequential factors. The variety of local effects does not by any means disprove unity of cause, but indicates differentiation produced by subordinate circumstances.

When, however, the causative factors acquire great power, and the vital capacity to resist their effects becomes seriously compromised, then different organs in the same local vicinity are liable to become morbidly affected at the same time. To treat these manifestations as different local diseases is to lose much valuable time, to ignore the causative factors, and to mislead the sufferer as to the nature of the affection and his own responsibilities, as is shown in the above narration.

Another illustration of the same principle was that of a gentleman who sought my advice for prolonged and intractable constipation, which had not only refused to yield to ordinary remedies, but had caused, or rather was associated with, serious mental depression in the form of decided hypochondria. He was about thirty-two years old, naturally robust and muscular, and made vocal music his profession. What he

desired was something more than the transient palliation he had heretofore received, but which in no wise bettered his health; and hence he betook himself to the idea of development of defective power as a last untried recourse. He was accordingly supplied with directions for the self-management of his difficulty, and was desired to report in two weeks for further advice, should it then be required.

At the second interview it was manifest that the seat of the difficulty had not been reached. Further inquiry elicited the fact that the directions had not been pursued as a whole, or with any vigor; the reason alleged being the possible ill effect that might ensue to his *hernia*, this being the first intimation that protrusion was any part of his difficulty.

An examination revealed a very tightly-fitting truss, whose excessively strong spring crowded the pad into the tissues of the hernial canal with great force. This had been worn for several years, and could not be dispensed with, the protrusion with pain immediately reappearing on the omission of the pressure. He was directed to employ the following processes twice a day in his room:

1. Process	1.	4. Process	14.
2. "	7.	5. "	17.
3. "	13.	6. "	22.

In two weeks he again appeared wearing a decidedly cheerful countenance, announcing the fact that all his symptoms were improving, especially the constipation. He had partially abandoned the truss, but felt disposed to wear it a part of the time for safety, being in fear of possible consequences of its entire omission.

This fear evidently arose from the force of habit, and from the consciousness of the real injury to the local tissues, and to the muscles connected with sustentation by the prolonged use of the instrument. So far as relates to the local tissues, experience shows that this fear is ill founded, as sustentation of the contents of the abdomen and pelvis is consecutive

upon the establishment of rhythm, which the truss really hinders; and that rhythm may return, even before the hernial tissues become restored. The same is true as regards the contents of the pelvis, as was abundantly proved in the present instance; for the control of the rectum and the alvine discharges had fully returned. In this difficulty, the gentleman was advised to receive treatment daily at our rooms, till he should acquire complete confidence in his restoration, and overcome his fear of the consequences of abandoning his truss. This plan he accordingly pursued. The processes to which he was subjected were essentially the same as those hereafter described in connection with assisted cases of pelvic or hernial affections. The truss he meanwhile abandoned, this time permanently. He discontinued further attendance in about two weeks, having fully recovered his buoyancy of spirits and effected the complete removal of his constipated habit. No vestage of hernia remained.

PROLAPSE OF THE RECTUM AND HERNIA IN CHILDREN.

The tender years of childhood and even of infancy, do not preclude the application of the same principles or detract from their practical value. Children are sometimes afflicted with hernia; probably more frequently with a most annoying prolapse of the rectum and other evidences of weakness of the sustaining mechanism. The following instances within the author's observation afford excellent testimony to the therapeutic merits of the principles herein explained; they are here recorded to show the overwhelming power and efficacy of these principles, though the processes be accidental and even unrecognized.

The male child of Mr. D., about two and one half years old, had been troubled from infancy with prolapse of the rectum. The part seldom failed to require manual replacement after every evacuation of the bowels. Otherwise, the child

appeared healthy and bright. No medical suggestion had been left untried to remedy the weakness, and the parents were awaiting with no little anxiety the effects of time and growth. At this time the family went to reside in a house in which an ordinary "lift" or dumb waiter was in frequent use to facilitate the transportation of articles to floors above. The child was fascinated by the operation of the machine, and particularly by the dangling rope depending from pulleys above, which he constantly insisted on seizing, to assist the servants in pulling downward by it. The mother noticed decided improvement in the child's condition and rightly connected it with the upward reaching of the child for the rope and his frequent hanging with his hands grasping it. The child permanently recovered control of the sphincter in a few days. There could be no question as to the real nature of the difficulty. Respiratory rhythm had all along failed to effect its sustaining purpose; the new exercise was specific to that end; the abdominal walls were strengthened, and engaged henceforth in their natural functions. Other remedies, in the nature of things, were incapable of reaching the sources of the difficulty.

The following interesting account of auto-cure of hernia in a still younger child is contributed by Dr. E. S. Holt, who is familiar with the principles contained in this work, and might easily multiply instances affording abundant practical illustrations of their efficacy and value.

The case is that of a male child, perfect at birth; at the end of two months his mother discovered signs of umbilical hernia; the umbilical opening had previously appeared to be closed. The protrusion appeared to increase after severe crying spells, which were due to disturbance of the digestive organs. There was lack of power to expel feces, and daily injections were necessary. The hernia attained the permanent size of a walnut. From its first appearance, the usual appliances, as elastic bandages with pad, adhesive strips, local as-

tringent lotions, etc., were used, without affording the least improvement. When the child had attained the age of one year it was noticed that when playing on the floor and a little fatigued, he would spontaneously assume the knee-chest position. This attitude became by degrees more frequent and prolonged, until it would be taken perhaps twenty times a day; the position was often varied by slight, swaying motions, forward and backward, and from side to side. The position and the motions manifestly gave the child comfort, as the correct processes always do to those for whom they are therapeutically needful.

The child would often go to sleep in the position described, and if disturbed and not fully awakened would directly resume it, the act being spontaneous and instinctive. It was seen that the hernia was improving; the child's spontaneous efforts were thereupon seconded by very gentle manual massage applied to the abdomen, to increase the effect of the child's self-applied muscular processes.

Two months from the commencement of this auto-therapy of the child, the protrusion was found to be entirely reduced—not a vestige remaining. The opening was completely closed and firm. The child's practice affecting the abdominal muscles as above described, continued for a few weeks, gradually diminished, and was finally wholly abandoned.

The *assisted* processes which may be employed by the nurse for the benefit of chronic difficulties of the digestive organs of very young children may appropriately be mentioned here. For feeble infants of less than a year, manual massage of the extremities (including *all* the limbs), should always be thought of, and if applied with due regard to the little patient's feelings will always be serviceable. Massage of the abdomen and back should succeed that of the limbs. This will assist digestion, and obviate the many ills proceeding from indigestion for which medicines are resorted to with less profit. Such processes also promote sleep, hard-

en the flesh, and prevent hyperæmia of the spine, from which often proceeds the most dreadful consequences that may befall these little ones, viz. infantile paralysis, followed by deformity.

For hernial and rectal protrusion, the child may be laid face down across the lap of the nurse, the chest resting on one of the nurse's thighs, and the legs upon the other. One hand of the nurse is then placed under the abdomen, the other on the back, opposite the first, so as to include the abdomen between the two hands; the part included between the two hands is then compressed, the pressure being made alternately greater on one side and then on the other, changing the degree of pressure applied by the two hands a dozen or more times. This process is a modification of the processes 22 and 27 in Part II., and its effects in lifting the contents of the abdomen and strengthening the back are similar to that.

Twisting the body while held at the hips between the knees of the assistant, the hands of the little patient clasped on its head, will also be found efficacious in the same direction.

The self-cure of hernia in women proceeds on the same general principles as in men. As these methods are nearly identical with those effective in case of malposition of the pelvic contents, the reader is referred to the chapter on the treatment for those affections. A few words are, however, called for here in relation to the injuries inflicted by the false notion of need of artificial support in both classes of affections resulting from defective sustentation; those in which the product is protrusion through the exterior abdominal wall, and those in which the consequence of intrusion is manifested in the pelvis.

Women suffer far more than men from the evil effects of mechanical palliation.

For women this class of contrivances take a great variety of forms besides that of the truss. The corset, the bandage,

the supporter of the abdomen—in multitudinous forms—all produce the infallible consequence of diminishing the power of the muscles thus confined, and therefore the organic rhythm ; they therefore render the possibility of actual recovery quite hopeless, until the sufferer is able to see the necessity of pursuing advice exactly contrary to that she has been following. A case in point is the following :

A lady whose home is in a distant city, visiting relatives in New York, was induced to call with her sister, a patient, at my office. Her visit to this city was strictly limited to one week. She had hernia, for which she had for a long time been wearing a Banning supporter, which combines the hernial pad with counter compression over quite an extended surface of the body. She was encouraged in the hope that by attending the assisted processes during the period allotted for her stay, she might find herself able to pursue a course of self-applied processes which would be adapted to remove the foundation of her difficulty. It was important that she be able to discard the instrument and to acquire the confidence in her ability to do without it as early as possible, which in one so weakened often requires moral aid. She was able, by the use of the processes, to control the protrusion, till at the end of the week she no longer feared its recurrence. She was directed in self-applied processes, similar to these designated in this chapter, and returned home, confident of completing her recovery. She now needed to remove the more or less permanent damage to her muscular system, inflicted by the instrument under the delusion that it was remedial. A letter received after a few weeks of home practice, which not only did not conflict with, but really aided her strength for other duties, gives the gratifying assurance that the desired effects are following the causes, and that self-support is real, while the so-called mechanical support, though appearing to aid, was in fact, sapping the very foundations of health.

XX.

Hernia of Extreme Degree of Development; Hernia in Weak Subjects.

This class includes cases requiring medical assistance, even though the fundamental principles on which restoration depends are well understood by the sufferer. Assistance is required because the great size of the tumor renders it unmanageable by the patient, or because his general physical powers are too restricted, or because long habit of employing his powers through particular channels and their consequent defect in other channels of use, renders the control of their direction difficult or impossible by the patient. The difficulty in this case consists in faulty co-ordination; the physical energies of the patient are not brought to bear at the desired point. The power requisite to draw in, and to retain the hernial protrusion, must therefore be concentrated; focalized, by physiological conditions and mechanical devices, adequate to secure the end in view.

In all these cases the mere reduction of hernia is but an incidental purpose; the acquisition of the powers whose effect is permanent retention, is the radical purpose. This is attainable by a well conceived and directed plan of cultivation. Remedies which stop short of that effect are in reality something less than is implied by the term.

The remedy supplied in mechanico-therapeutics has the most radical and permanent effects as its aim, even in the most difficult and hopeless cases. The processes for securing radical effects in the most difficult and obstinate cases are shown in the following examples:

Mr. Gaunt, fifty-two years old, short, stout, somewhat disposed to adipose; by occupation, superintendent of a manufacturing establishment; had been greatly disabled by hernia during twenty years. This gentleman was induced to resort

to the methods herein presented, by another, who had recovered through the same means of prolapse and strangulation of the rectum, accompanied by proctitis with sloughing.

An examination of our patient revealed an enormous scrotal hernia, measuring nine inches in circumference and six and a half long. Its dragging down was mitigated by holding the mass in an extemporized bag attached to a stout girdle about the loins. The contents of the sac were apparently omental, and it afforded no indication of containing fluid.

This condition of the scrotum, sustaining a weight so heavy as seriously to interfere with active life, had however experienced considerable variations. The hernia, during the earlier years of its existence had been reducible; he had even worn a truss a portion of the time. But, for the few years past, it had successfully resisted all efforts of the most expert surgeons to effect reduction, and of course could not be approached by a truss. If it never had been, it would have been far better; for the enormous size was probably due to the enlargement of the opening by the pressure of the truss pad.

In reply to the anxious inquiries of my patient as to his curability, he was informed that that depended on the success of the proper efforts to make room for the contents of the hernial sac in the abdomen, where these contents legitimately belong. He afterwards frequently referred to the new hope inspired by the suggestion involved in the remark, of an intelligible and practical plan of action to secure the desired effect, from which a remedy might be expected as distinguished from compromise and palliation. To secure the end in view the patient's presence was required at our rooms daily for about an hour and a half, during one month.

His treatment consisted of the application of the following processes, referred to by number and found described in Part II.:

1.	Process 40.	6.	Process 30.
2.	" 8 and 9.	7.	" 18.
3.	" 35.	8.	" 19.
4.	" 25 and 26.	9.	" 16.
5.	" 34.	10.	" —.

The actual time consumed in the application of these processes is much less than that above noted, as it is absolutely essential that there be a period of entire inaction after each process, and before the next is engaged in. The first conspicuous effect experienced was great diminution of appetite. This was caused by the absorption of fat, always superinduced by quick massage. Omental fat nearly always diminishes in such patients as have too much, whatever the affection for which this form of remedy is applied; and in this case the effect described was particularly desirable. The disappearing fat, of course, supplied temporarily the purpose of food.

This class of invalids also experience a peculiar lightness of feeling, apparently a reaction on the spirits, probably due to the changed location of interior visceral parts, and to the restoration of the mechanism of rhythm, from whose defect or absence the organism doubtless suffers in other ways than that described in connection with affections of the lower segment of the trunk.

At the seventh return of the patient for his usual daily treatment, he entered with a smiling countenance, and announced that his hernia, which had been before noticed was really diminishing, had entirely disappeared. An examination confirmed his statement. The scrotum was found closely hugging the body, including nothing besides its legitimate contents. The enormous distention of years duration had completely disappeared. The completion of the subsidence of the tumor had occurred during sleep the previous night.

This mode of disappearance is in accord with the princi-

ples taught throughout this work. The actual mechanism for withdrawing compression upon the pelvic contents and hernial border is organic rhythm. The action of this automatic mechanism is easily re-enforced, even exaggerated, by specific cultivation of the powers which engage therein. It is in unembarrassed operation during sleep; the energies of the system are not diverted by the volitions and by the uses having their source therein. And the direction of gravitation in the posture of repose is changed, so that the automatic activities are unopposed, and act specifically and locally with full force.

The effects arising are accumulative, as was shown in this case, and are capable of rising, by time and due attention to the purpose, to any desired degree.

Mr. G. continued his treatment, with such variations as his increasing strength suggested, to the end of the month. Such continuation is simply the dictate of rational propriety, to insure adequate strength and automatic control of the sustaining mechanism, and also to acquire the substantial development and due hardening of the tissues immediately connected with the hernial parts, to close the canal and to thicken the mechanical fibres entering into its composition.

The prominence of the tumor and its accessibility to the touch of the physician in this case afforded excellent opportunity to test the mechanical value of several processes, previously shown by experience to be useful. It was in this way found that all twisting motions, especially those resisted (Processes 18 and 17) produced a retraction of the tumor. This effect was probably due to sympathetic action of other muscles than those directly engaged by the process. Also that the rotation (Process 16) was particularly applicable to the needs of the canal ; and that co-incident expansion of the chest and contraction of the abdomen caused by any of the processes described in Part II. to which that effect is ascribed, produced a drawing in of the protrusion not always felt by the patient.

The kneadings (Processes 30 and 32) were found of unequivocal service, the first for changing the location of the superincumbent mass, the second, which was allowed to impinge directly upon the tissues of the hernial canal, was essential for the local effect of thickening and hardening the tissues.

It was an appreciated advantage to the gentleman whose case is above described, that he had become unable from the enormous increase in size of his protrusion, to use the truss for its palliation. The local hernial tissues were in a better state and immediately responded to the means used for development, while the muscles connected with rhythm had not been systematically and continuously repressed by a compressing band. In the following account both these conditions had to be overcome, but thanks to youth, an inordinate length of time was not required for this purpose.

A gentleman living in Brooklyn brought his son, fifteen years old, to my office for consultation on account of his wretched and evidently failing general health, rather than for hernia from which he suffered. He had on a Marsh truss that had been fitted to him a few months previously. The hernia was of the scrotal variety. Although the protrusion had been satisfactorily kept out of sight, yet the young man's health appeared to become progressively worse instead of better in spite of the truss. The patient appeared anemic, nervous, weak, irritable, and he was exceedingly depressed in spirits, contrary to his natural temperament and previous habits.

An examination revealed the fact that the spermatic cord was very tender and much swollen. There was also epididimitis ; very evidently these were effects of compression of the cord by the truss pad, which, in preventing the descent of the intestine into the scrotum had also obstructed the return circulation of the blood from the important organs contained therein ; so that while the potential cause of the affection was not in the least diminished or even recognized, the en-

deavor to conceal the obtrusive portion of the affection had interfered with and injured most important organs, and seriously compromised the whole nervous system.

This young gentleman received daily treatment by the processes and methods of mechanico-therapeutics one month; he was directed to discard the truss in one week from the beginning of his treatment, and he suffered not the least inconvenience in doing so. The local injury inflicted by the compression of the pad was rapidly recovered from, and he became cheerful and hearty, and has remained so since.

His daily treatment consisted of the following series of processes; requiring, with the intervals necessary to insure the effects, about two hours of his time.

1. Massage of feet.
2. Process 16.
3. " 40.
4. " 39.
5. " 35.
6. Processes 3 and 4.
7. " 6.
8. " 24.
9. " 25.
10. " 26.

After about two weeks, the following changes were made in the processes: Process 6 was omitted, and Process 18 and Process 30 were added.

It will be noticed that the first part processes of the series consists largely of mechanical massage. The reasons for this preliminary should be made intelligible, for this order of procedure, in cases of great feebleness and sensitiveness, is essential to success, at least to the most rapid recovery the case admits of. Massage is effortless, consequently does not involve nervous action, nor is it followed by the least sense of fatigue. By massage the physiological process of interchange of substance, involving the supply of nutritive support and the exclusion of waste products as occurs in health is approximately secured; and the processes are therefore indispensable in ænemia; blood, bearing nourishment, is conveyed into the acting parts in immediate proximity with vital cells, and the products of waste are instantly conveyed away,

leaving the vital process of development of power, nervous and muscular, unembarrassed. At the same time any excess of blood, as in congestion, loaded perhaps with the noxious matters destined for elimination, is removed. These effects would ensue much more slowly if left unaided by massage. There was too little vigor in the vital operations to completely effect these purposes.

The relevancy of the other processes, and the order in which they occur, will be understood by reference to the descriptions of the processes and their effects, under the respective captions and numbers.

The analogy between cases of the kind above described, and those of a multitude of young women suffering from pelvic troubles, accompanied by a high degree of nervous tension, is very strong, and justifies calling attention to it. The parts affected are in the same automical region, and are necessarily subject to similar mechanical influences. The consequences of local manifestations, whatever be the special form, extend through sympathetic nervous connections throughout the organism; the nervous reaction does not end with local pain, but is very marked in the form of depression of spirits, bordering on despair, manifested as hypochondria and hysteria, and not unfrequently great supersensitiveness of the cerebro-spinal centres.

The source of the difficulty in each case, however local it may superficially seem, is always easily demonstrated to be defective sustentation, since every vestige of the nervous symptoms disappears with the disappearance of the protrusion or intrusion, as the case may be. The cause of defective sustentation is identical with that of local pelvic hyperæmia and its products, because the fact depends on the same mechanism; and the local consequences of its defect are removed by the restoration of the activity of this mechanism by due and judicious cultivation of the same organic capabilities and powers. This mechanism, viz., that of trunk-

rhythm, eludes the observation of the patient, because automatic and outside the scope of the ordinary consciousness; it is brought to light only by the remote consequences of its imperfection; but its scope and power are fully demonstrated in the therapeutic results of its cultivation.

XXI.

Uterine Affections. Self-cure of Displacements and Congestions.

The reasons for the usual intractability to remedies of affections of the contents of the female pelvis, becomes apparent in the light afforded in Parts I. and II. of this work. These may be briefly summed up in the statement, that there is often at least partial misapplication of remedies. Remedies are too much addressed to the resultant, and too little to the producing factors; the consequence is that while the local manifestation is being removed, it is also being reproduced. The ultimate result therefore depends less on the positive value of the remedy, than on the ratio the two factors, the curative and the causative, bear to each other. In practice, this result is sometimes satisfactory, without, it is feared, a profound understanding of the relations of these two factors, and therefore of the merits of the remedy; but more frequently with results, which, expressed in the mildest phrase, are at best, equivocal. Good results in every form of disease, may spontaneously occur. Invalids do not philosophically inquire into the quality and nature of their environments. These may be even better than the remedies they at the same time employ; remedies may therefore without challenge appropriate the credit for effects they were desired to produce.

Successful self-treatment of affections of the contents of the female pelvis, is founded on the intelligence of the sufferer. This intelligence she may be compelled to trust in

place of the physician's prescriptions. She may be advised regarding special diagnosis, and as to adjustment of processes. But in addition she needs to be pervaded by a spirit and determination begotten only of an intelligent comprehension of the philosophic principles whose aid she invokes and on which she should be determined to rely. This comprehension is required to afford her the necessary assurance that the improved physiological conditions which she may easily command and which require only moderate, but intelligible effort, must, in the nature of things, displace the consequences of inferior physiological conditions, so far at least as these relate to the mechanical control of the contents of the pelvis.

It devolves on the patient in the beginning to learn to distinguish between the actual and controlling factor of her affection, and its subordinate ones, which are always those clamorous for immediate, specific, exclusive attention. No progress can be made till this is so well understood that the influence of knowledge shall preponderate over the influence of the feelings.

The problem for her solution is not merely that of raising the contents of the pelvis to their natural and wholesome mechanical position; all similar patients and their physicians for that matter seek the same end. But the purpose is to increase the sustaining powers till these shall have acquired their full normal capacity, which assures permanency because the action is automatic.

So, too, it is not her purpose merely to remove pelvic hyperæmia, nor even its consequences and outgrowths too numerous to particularize; appertaining to parts of the generative intestine, or its whole. The gynecologist is usually intent on this object, ranging through the gamut of variations. The purpose of the sufferer is rather to restore the action of the mechanism, through whose defect morbid local consequences became possible, so that this mechanism

shall automatically maintain that degree of local drainage which is nothing short of excellent health of the pelvic organs. The patient's supreme object therefore is to raise the nutritive activity in the dominating parts; these are the rhythmic mechanism; so that the mechanism on which physiological duty depends shall be developed to the requisite degree and act successfully against all obstacles.

The ambitious self-restorer contends with obstacles, which, in connection with the acquired defects she designs to overcome, are sufficiently serious; she should recognize and be prepared for these. The first of these obstacles is faulty habit. The muscles connected with rhythm, (of whose defects the local symptoms are a direct evidence), have by neglect progressively diminished in power, and finally nearly or quite lost their automatic extension to the pelvic organs. The nervous energies flow in obedience to the will, and are more freely conducted in other directions because more employed. The ordinary incentive is insufficient to secure muscular response; the organic powers are pre-engaged, probably in profitless, nervous and emotional expenditures. Restoration means physiologically, the use of the very muscular groups which have least tendency to activity, voluntary or automatic. The condition is paralleled in the familiar experiment of trying to perform with the left hand the services of the right hand.

Some of these repressive habits are quite common among invalids of the class under consideration, and are promoted by current popular prejudices. There is one which would be ludicrous in its inconsistency, were its tendency less serious. Many times have I found invalids of this class seriously objecting to raising their hands over their heads, asserting that they had been told that something uncommon would thereupon happen in reference to the pelvic contents. These invalids must be constitutionally perverse or forgetful; for, on inquiry as to the source of this warning, it is not

unfrequently attributed to some physician. These patients sometimes relate the conflicts they have had with their instincts to sleep with their arms raised; when shown that their pet animals nearly always assume that position, their doubts begin as to the salutariness of the advice they have followed. A moment's reflection shows that the residual air of the chest is increased by the tabooed position of the arms; that the labor of respiration is thereby proportionally diminished during sleep; and that the respiratory rhythm becomes abdominal and even pelvic, instead of being limited to the top of the chest.

The truth appears to be that the ordinary activities of most women fail to call into requisition as much of the muscular system as is needful for health, and that the neglected parts are those physiologically, as well as mechanically, connected with rhythm and sustentation: that the instruments of the latter function, therefore acquire the persistent habit of shirking their appointed automatic duty from lack of the occasional but necessary re-enforcement by the will in the performance of volitional duties. The ultimate consequence is that the unfortunate victim of the decline of her natural powers is unaware of even the existence of the fact of the factors, rhythm and sustentation, because these are automatic; but becomes absorbingly so of the derivative consequent, and subordinate effects, because these are connected with the sensory powers and with the consciousness.

The principles of mechanico-therapeutics indicate clearly the way in which the faulty physiological habit, the root and source of the affections located in the lower part of the cavity of the trunk including a portion of its walls, may be corrected. The remedy is to be secured, not by trying to undo the consequences but by removing the causes, through such distinct, well planned and well executed processes as are adapted to control the nutritive support of the failing parts and therefore to strengthen them; and these are to be

sharply distinguished from the parts which are complained of, which suffer the consequences of imperfect physiological domination. The one difficulty consists of defects in the trunk and chest walls; the other is located at a considerable distance, at and near the inferior boundary of the abdominal walls.

The class of defects arising from the causes stated can never be removed through exercise. This recourse has so often failed as to produce a popular and justifiable prejudice against exercise in the common meaning of that term. The reasons for this statement partly appear above. Exercises engage the strongest, and also in these cases the wrong parts. Exercise is just what the sufferer is unfitted for and incapable of. Exercise is beneficial only through the easy supremacy of the volitions which in these cases are limited, in consequence of the prodigal and injurious waste of nervous energies through the preternatural activity of the sensations and the emotions. A branch of the obstacles to the self-help above discussed appears in the necessity for *specialization*, in order that processes shall be remedial. This requires the patient to assume such positions as shall *exclude* the action of certain muscles and *compel* the action of certain other muscles, the exclusion and the compulsion being strictly in consonance of the needs of the system to restore its lost balance. In this way the nutritive support of the excluded parts is diminished while that of the compelled parts is increased. To say that such positions and actions are sometimes awkward, is only saying that they are unaccustomed. Specialization may be determined and intensified by causing gravitation to fall wholly upon muscles of limited, designated parts. In the single processes, gravitation is made to replace resistance offered by an assistant.

Another difficulty encountered by the beginner of self-cure has operated through past time to prevent the proper appreciation of mechanico-therapeutic force. The effects are not

directly seen, and therefore not known. The author hopes in a measure to remove this difficulty by connecting pelvic with hernial affections. In the latter, the effects of precisely the same processes are immediately seen, felt, understood, and unequivocally known. The sufferer from pelvic manifestations knows that the same degrees of the same forces are operative within the pelvis as at its lateral borders, and therefore of necessity produces the identical consequences. There can be no obscurity about this; the consequences are absolute, decided, indisputable. The ten to fifty pounds she can lift from the interior hernial border is also lifted from the whole included sectional area. She cannot lift a cup and leave its fluid contents; the whole rises, and the forces causing the rise are far more cultivable than the fingers engaged with the keys of the piano, because immediately merging with automatic activities.

The conviction therefore rises to the force of demonstration, that the same kind and degree of effects are secured by mechanico-therapeutic processes in case of intrusion as in extrusion; and the inference is equally irresistible that the same mechanico-physiological defect may result in either, and indeed in a respectable minority of cases in both consequences. Both pelvic and hernial manifestations are the equivalents of their causes, which has been shown to be capable of either. The removal of these causes becomes equally remedial in either affection. These considerations will sustain the hopes of the beginner of the self-applied processes, till positive amelioration of symptoms assures her of the curative power of her remedy.

A third difficulty relates to *time*. The idea of being obliged to wait results of physiological development to gain therapeutic ends, appears to disfavor the auto-remedial processes. This conclusion is, however, not justified by experience. The class of affections under consideration, are not, in their nature susceptible of actual remedy by methods aim-

ing only at immediate and superficial ends, and the quickest way is that which deals with the foundations, rather than those which practically defer the real issue, till it becomes irremediable.

The suffering woman, accustomed to remedies whose effects are immediate, in which no idea of permanency or its opposite is in any way associated, may be impatient of the delay which appears to be involved by self-applied remedial processes. In mitigation of this difficulty, the patient will learn, and may better do so first than last, that no remedy is really such, only in proportion to the permanency of its effects, and that the element of time is always necessary to demonstrate its value. In the light of this fact, it may be asserted without the least fear of contradiction that mechanico-therapeutic remedies are the most rapid as well as complete and satisfactory.

In case of remedial auto-processes, the effects are in the nature of ordinary growth and repair of the substratum of vital force in its forms of energy and of function, and are therefore unconscious. Remedies which powerfully appeal to the feelings and senses should therefore be distrusted as being contrary to nature. These are therefore far more equivocal in the evidence they afford of their reality as remedies, than the former class.

A fourth difficulty arises from misconception. The patient hesitates to disturb the sore and painful contents of the pelvis. She remembers the ill effects of standing, walking, climbing stairs, etc. Even very limited experience refutes this misconception, for it shows that whereas the exercises referred to are partial, and serve to concentrate their effects in the region least able to bear them, the *prescribed* processes, even though self-prescribed under the guidance previously given, produce the contrary effect. The power of ill-directed processes, spontaneous or otherwise, to produce injurious effects, demonstrate the power of well-directed

processes to produce healing effects. The causes being reversed involves the reversal of the consequences.

It is unnecessary to illustrate and enforce the principles of self-help in pelvic affections by detail of cases. The fundamental principles explained in this volume have been for several years before the public in the author's work entitled "Diseases of Women," and their value has been put to satisfactory tests by its readers. The processes are similar to those required for hernia, differing only in such adjustments as may be proper in reference to individuality and to sex. Of these, the self-prescriber will, of necessity, judge, aided by the opportunity afforded for experimentation. The knowing and judging faculties become of course sharpened and perfected by their exercise.

Subjoined are some of the combinations of processes most frequently employed in self-treatment of pelvic hyperæmia and displacement, and the various symptoms which proceed therefrom. These may easily be extended and diversified by the patient, who must always keep in view the fundamental principles stated in "Massage" and in this work.

I.

1. Process 1.
2. " 14.
3. Process 17.
4. " 13.

II.

1. Process 1.
2. " 15.
3. Process 7.
4. " 21.

III.

1. Process 5.
2. " 18.
3. Process 19.
4. " 22.

IV.

1. Process 5.
2. " 20.
3. " 17.
4. Process 22.
5. " 36.

V.

1. Process 1.
2. " 19.
3. " 11.
4. Process 12.
5. " 36.

VI.

1. Process 5.
2. " 6.
3. " 12.
4. Process 19.
5. " 13.
6. " 36.

VII.

1. Process 23.
2. " 1.
3. " 15.
4. Process 36.
5. " 12.
6. " 22.

VIII.

1. Process 36.
2. " 3.
3. " 20.
4. " 10.
5. Process 15.
6. " 11.
7. " 17.
8. " 19.

The processes indicated above, it will be observed, refer chiefly to the central portions of the body, and have the purpose of changing the shape of its cavity, and to extend the physiological action which raises the contents of its cavity and diffuses the venous circulation. The above noted processes do not include those often required by these cases, to secure counterpoise of the circulation. By counterpoise is here meant such action of other parts as will result in distributing a portion of the blood to the extremities to maintain their heat, and to aid in diminishing the local pelvic excess. These objects are secured for the helpless class of invalids, by means of motion communicated to the extremities by art, that is, local processes bearing the common name of *massage*, effected with great certainty and rapidity by mechanism adapted to that use, and described in Part II. Such mechanism is shown in processes numbered 34, 37, 38, 39 and 40.

The absence of these helps in cases of self-treatment, often requires the substitution of special volitional exercises or single movements of the extremities. A number of this class, adapted to the purpose now contemplated, will be found described and figured in the volume entitled, "Health by Exercise," to which the reader is referred.

In case there is a tendency of the extremities to become cold during the use of the processes indicated in the above formularies, it will be necessary for the patient to precede them by such exercises of the extremities as she may find most successful in creating warmth in the feet and hands. The specialized processes denoted in the preceding formularies and other equivalent processes will then be followed by far more satisfactory effects.

XXII.

Uterine Disease: Uterine Malposition.

While self-help is not difficult in the early stages of affections of the pelvis, requiring only the knowledge of a few guiding principles and the power to execute a few typical processes, such power progressively declines in proportion as the local manifestation is allowed to develop. The original source of the difficulty, whatever its form, remaining uncorrected, its influence and ascendency are inclined to increase, till the organism is overwhelmed by the reaction upon it of the local consequences manifested in the pelvis.

These consequences assume a variety of forms, which the sufferer is inclined to interpret as so many distinct self-subsistent, self-propagating diseases. One division of these forms proceeds from retention in the pelvic tissues of excess of blood, which has failed to become distributed among the tissues of the general system; this failure depends on defect of the distributing mechanism. Another division of consequences is unequivocally mechanical in form, and arises from loss of mechanical control by the organic system

of the solid contents, which control is necessarily, under the circumstances, assumed by gravitation, the effects of which are subject to mechanical modifications of considerable variety.

These causes, singly or united, conspire to render the pelvic contents a centre of consciousness. The morbid impressions of which this important centre of the organism is the seat, reacts through the nervous mechanism, and the whole organism yields to their influence. The feelings, thoughts, judgments centre upon one object at one point. This fact of preponderating sensibility serves to disconnect the local manifestation and its sources. It also diminishes the command of the invalid over her own energies: these have become pre-engaged in the form of sensibility, and she is proportionally unfitted for self-help.

Self-help becomes progressively more difficult in proportion to the degree of the local manifestation. The obstacles are the restriction of general muscular power: the constant decline of the power and influence of the mechanism which has been shown to relate to the control of the pelvic contents: the difficulty in reinstating action in portions of the organism long neglected: and more than all, the unhinged and misdirected nervous activities, a feature which always complicates these cases, and whose import is almost always misconceived.

Women in whom the nervous powers preponderate by inheritance or by acquired habit are those in whom pelvic difficulties are more liable to appear, from the fact that this is the very class in whom the muscular and therefore the sustaining power, and the control of the circulation are naturally feeble, and require special assistance to secure these functions in their due and normal degree.

Should however these prophylactic and remedial needs be not only withheld but additional obstacles be interposed, the difficulties of self-cure become increased beyond the patient's

capacity; and this must be re-enforced or provided for in the use of exterior supply.

In the light of the principles which have been set forth, it can be scarcely doubted such additional obstacles to recovery are imposed in the consequences of not a little of the palliative local treatment of the accessible portions of the pelvic contents, so profusely supplied under the impression that cause and effect are centred at the one point of manifestation.

The rapid and satisfactory results of the mechanico-therapeutics of the pelvic contents affords strong evidence of the correctness of this suggestion, which is still further confirmed by the view here taken of the real nature of this class of affections.

The inappropriateness to the needs of these cases of mere palliation has been sufficiently explained; it remains to show the injurious reaction which may result.

One of the mildest forms of local palliation, doubtless consists in irrigations of the accessible parts of the pelvis with hot and with cold water. It is the effect of temperature which is mainly sought in these applications. The use in this way of cold water, once much in vogue, has fortunately gone out of fashion: the principal effect is that of incitation to the local production of heat. The disadvantage is, the local power of feeling is increased, and is easily carried to an abnormal degree. This arises from the reaction of the sensory impressions on their source, causing exaggerated nutrition of the spinal centres.

Heat, as hot water, employed in the same way, diminishes metabolisis or transformation of substance, here, as everywhere in the organism. It therefore temporarily diminishes pain. The real and primary purpose of remedies, which is to increase the power and sway of vitality, is, in this remedy sacrificed to an inferior and subordinate purpose, that of diminishing power, whenever it assumes disagreeable forms.

This is done without materially advancing the radical remedial purpose. Heat also produces evanescent astringent effects, but cannot affect the source of the local trouble, or re-enforce the action of the rhythmic mechanism on which the morbid conditions found in the pelvis depends.

Similar statements are applicable to topical applications intended to ameliorate local inflammation and congestion. They are necessarily of transient effect, and do not in any degree remove the causes or impair the sources contributing to local hyperæmia. Topical applications of the class referred to may, however, extend in another direction a harmful influence. They, too, impress the sensory nerves, and are therefore liable to induce hypernutrition of sensory nerve centres, whereby energy which should be better employed, is changed to pain which may be local, relating to the pelvis, or general, and relate to distant parts.

Indeed, all the various endeavors to secure immediate relief of pain are liable to react disagreeably on the nervous system, and cannot be continued as a principle of cure without seriously increasing the obstacles to recovery and compromising the sufferer's capacity for restoration.

It has been shown that the primary factor in pelvic affection is defect of rhythm; and that this not only depends on muscular power, but on involuntary mechanism constantly evolving energy specially adapted to removing the causes of pelvic difficulties in whatever stage of development.

While it is true that the therapeutic requirement involves increase of muscular power, general and particular, for the purpose of acquiring ascendency of the dynamic over the nervous energies, or at least the equipoise of these two forms of power, and also for general nutritive effects, yet and for this reason the volitions can be employed in only a moderate degree, if the nerves have acquired a certain degree of ascendency in the organism.

Exercise, which creates large demands on the will, is there-

fore remedial only to a limited point. Beyond that, the effort reacts on the nerve centres, and defeats itself, as regards development of muscles. The nerve action under the circumstances become disproportionate to the muscular effect.

It follows that the incentives to the development of the defective mechanism must be partly or wholly independent of the will of the patient. The nervous and muscular power of an assistant must be engaged, and especially must all the actions, from whatever source derived, be so directed as to affect the desired points, and must on no account be wasted in other and unrelated parts.

Prolonged Uterine Retroflexion.—As this form of uterine displacement and acquired deformation is a product of the same general causes that are equally operative in the production of all other malpositions of the uterus and connected parts, it will be sufficient to give details respecting this, in order to impart an understanding of the mode in which lesser and generally more easily controlled uterine malpositions are remedied. This displacement affords a superior test of the efficacy of mechanico-therapeutics, because of the almost absolute impossibility of remedying the affection by other means. In these cases of retroflexion the general health is seriously compromised; there is very great functional disturbance affecting the uterus, and also of the rectum. Indeed, the efforts necessary for discharge of alvine accumulations, are alone under the ordinary procedures in these cases, an effectual barrier to recovery. The mechanico-therapeutic method removes the two difficulties as one, and the bowels shortly act as in health, with no unnatural or disagreeable effort.

An example of prolonged suffering from retroflexion, one which had exhausted the skill of many physicians, and plans of treatment through a series of years without the least permanent effect so far as restoration of the position of the uterus was concerned, is that of Mrs. C. from an eastern state.

She was the widow of a physician, about thirty-two years of age, without children. She had invariably suffered the severest dysmenorrhœa at each monthly period from her first entrance into womanhood. This symptom had increased as the years passed on, continuing during her married life and afterward, without much interruption and no permanent relief. Usually, she was confined to her bed and room from one quarter to one half the time, scarcely recovering from one period before being taken down with another. She was very pale, and exsanguinated from the periodical excess, and as is frequent in these cases, obstinately constipated. She had been under medical treatment almost constantly for the last dozen years. She was unable to walk to my office, two hundred feet distant from her hotel, and required to be carried.

The fundus of the uterus appeared to be fixed, and in immovable contact with the rectum. There was considerable swelling of its body, and there was great local supersensitiveness. The dysmenorrhœa was doubtless due to the abrupt bend of the body upon the cervix, practically producing occlusion, yielding only to the severe forcing pains to which she had been subject.

Women thus suffering frequently refer the cause of the abnormal position acquired by the uterus to some long previous mechanical accident or injury, as jumping from a carriage, a fall, or other similar cause. Yet cases of the same kind are found in which no history of injury can be traced. My opinion is that mechanical accidents are not well authenticated causes of displacement, because neither physiologically or mechanically adapted to produce that effect. And this opinion is strongly supported by the indisputable fact that in every case of the kind, there is abundant cause for the morbid effect and its symptoms of another and more rational kind. This cause is the one repeatedly described as consisting in the imperfect working of the organic mech-

anism which controls the position of the pelvic contents. Accidental displacements, however severe, cannot possibly produce a permanent effect. This can result only from defective sustentation, which is not by any means capable of sudden interruption, but only to gradual subsidence. Besides, in general, visceral displacement produced by the kind of shock referred to is not in the direction of the pelvis. The solid posterior wall of the abdomen serves to guide a moving force forward toward the pubis; and the force and motion are arrested far above the pelvic contents.

The sole remedy employed in the restoration of the case consisted in the removal of the cause by means of the processes stated below. At the first period after beginning treatment, which occurred in about three weeks, not the least difficulty in the form of dysmenorrhœa was experienced. For the first time she was able to be about the house and to go to her meals without inconvenience, and only omitted going to my office as usual for prudential reasons. It was found on examination at this time that the retroflexion was not wholly removed, but was distinctly diminished, and the uterus had risen to a higher location. The rational evidence of the removal of the mechanical obstruction in the cervical canal was complete. The first evidence of improvement was the yielding of the constipation.

This lady continued the treatment for three months with such variations as were indicated by her increasing strength. At the end of this time her strength and capacity for active life had increased beyond her recollection of previous experience; and desiring to test the reality of her restoration, she engaged in a trying active occupation, which not only kept her on her feet most of the day, but compelled her to go frequently up and down stairs. She proved herself able to do all this without extraordinary inconvenience and without the least injury. As she was within reach of my office, she took occasion quite frequently to resort to the "processes," there

administered and adapted to her case. These doubtless assisted in protecting her against untoward symptoms and the discouragements to which they often lead. More than two years have elapsed since her recovery, and at last accounts she remains in good health.

The treatment employed for the first ten days is usually tentative, and more adapted to the redistribution of nutrition through the circulation of the blood, and to increasing oxidation than to local effects. The processes are largely those included in the term *Massage.* About three hours are devoted to their application, two of which are intervals of entire quiet between the processes. The following was the prescription for this preliminary period:

1. Process. Feet, see "Massage," page 179.
2. " arms, " " " 188.
3. " " 16.
4. " 8 and 9.
5. " 12.
6. " 26.
7. " 25.
8. " 30.
9. " Massage of spine, see "Massage," pages 166–7.

After ten days her treatment included the following processes:

1. Process 40.
2. " 37.
3. " 38.
4. " 8 and 9.
5. " 3.
6. Process 16.
7. " 26.
8. " 37.
9. " 30.
10. " 24.

The immediate purpose of these processes is apparent on even a superficial view. The preliminary purpose is to diffuse the circulation and encourage it in the extremities; this unloads the central organs. The second purpose is to encourage vital heat production. Massage is the great instrumentality to secure this end. It is not heat additions

from exterior sources of supply that is desirable. Heat supplied directly to the organism discourages its normal production within the system by removing the incentive : the physiological incentives to heat production are inter-molecular action resulting in oxidation ; and cold, which conduces to the same effect.

Physiological heat production has most important consequences. It supplies that fixed temperature at which vital processes occur ; it is largely the result of oxidation and therefore is the means of eliminating oxidable matters ; and it is the constant accompaniment of muscular and nervous power with which it probably somehow correlates. It is therefore a therapeutic mistake not to stimulate in the vital system of the feeble the heat-producing activities by supplying the natural incentives thereto, as an important auxiliary to the development of the more vital forms of power with which heat production is associated.

The third purpose of the processes is to lift the contents of the abdomen from those of the pelvis, so as to allow the latter to rise to a higher location. As before explained, the power brought to bear on the uterus by appropriate physical means is incapable of being resisted, either by its obliquity, its incurvation, or even by adhesions to contiguous parts. By repetition the processes are fully capable of effecting progressive divulsion of adhering parts, and therefore of liberating the uterus, even though strongly bound. In the case above narrated, as in most of this class remedied by similar processes, the retroflexed uterus first rises to a higher position, becomes disengaged from under the promontory of the sacrum, and the rectification of its curve proceeds gradually till fully accomplished.

The fourth point to be gained is the development of the mechanism concerned in sustentation, so that this effect becomes automatic and constant. The mechanical action henceforward goes on during sleep as well as during waking hours.

The last point is the development or rather the return of natural power to the limbs, especially the action of the small muscles about the head of the thigh. These are manifestly helpful in guarding against and in removing local pelvic hyperæmia.

The reader's attention is particularly called to the contrast between the purposes and processes above stated with those with which the invalid public has heretofore been content.

Retroflexion, before becoming fixed by adhesion and otherwise, may sometimes be readily corrected by the insertion and subsequent semi-rotation of the uterine sound. The position of the curve is thus reversed. This recourse besides being positively dangerous from the local mechanical injury to which the parts are exposed, is also useless. It has no effect on the cause, and the organ immediately relapses to its former state.

The pessary is an ever ready recourse employed for the same end. It is hardly necessary to say that it is impossible to reach, much less to correct, the incurvation by an underlying obstacle. Some temporary relief may however result from the mechanical separation by it of parts abnormally compressed. The pessary has practically no resting place below it, even when connected to an exterior band, and therefore can sustain nothing. Should the instrument in fact as in theory, exert an upward force, the effect would be so much the worse, since the uterus would then be between the two pressures of which flexion, the very trouble it is desired to remove, would be the inevitable consequence. The pressure supplied from below cannot have the least effect in mitigation of that from above.

In the cervical canal of a recent young lady patient, I found a rubber stem, terminating at its inferior extremity in a button, which was inserted one year previous, under chloroform. A hard rubber pessary of usual form was inserted at the same time. The conjoint instruments were expected to

cure dysmenorrhœa by sustentation and freeing the outlet. The procedure had, however, achieved no result as affecting the dysmenorrhœa. Additional symptoms had meantime supervened, among which was a constantly annoying tenesmus of the bladder with a great deal of local neuralgia of the different pelvic contents. She was placed under daily processes, having effects similar to those above described, and adjusted to the varying peculiarities of her case; the instruments were removed soon after. She progressed favorably and had no more local trouble. Previously to adopting the remedial methods here inculcated she had spent a year unavailingly at a health resort, where she regarded herself as having improved, but not in the special symptoms she was desirous of removing.

A few years since a lady prominent in society was treated by me in the method above described, whose monthly dysmenorrhœa invariably produced hysteria, ending in profound unconsciousness, simulating coma; the insensibility often lasted twenty-four to thirty-six hours. Her physician finally learned to avert the paroxysm and its nervous concomitants by passing a common catheter through the cervical canal, which of course gave free passage to the flow. This however produced not the least effect on the cause, as when this recourse was omitted all the old symptoms were sure to be repeated. She resorted to treatment under my care, and had not the least difficulty at the next recurring period, nor ever after. She soon mastered the leading principles and carried them out to their practical and beneficent effects at home. The catheter could not remove the stenosis; that was possible only by providing physiological sustentation. The insufficiency of mechanical devices for the relief of malposition of the pelvic contents is paralleled by that of medicaments addressed to the same purpose, whether administered locally or through the system at large, both being quite irrelevant to the actual source of these pelvic affections.

The principal reason for the neglect of the foundation of these affections, is the ease and readiness with which palliation may be supplied, and palliatives in the estimation of uninstructed sufferers are indistinguishable from actual remedies. This is because the test the invalid applies is merely that of the senses upon which the palliative class of remedies is accustomed to play; and not a philosophical understanding of the subject. Back of this is the desire and tendency to evade the responsibilities of habits which superinduce disease; and those habits also which are necessarily involved in acts conducive to restoration.

A prominent phase of the difficulties encountered by invalids with pelvic symptoms is the tenacity with which they adhere to the idea that displacements, deformities, congestions and their consequences are attributable to some peculiar and inexplicable fault of the organs themselves, and that to these organs is therefore due some sort of corrective discipline. It is most difficult for invalids to understand the very simple and common-sense principle that the uterus is quite passive as relates to its location, that it merely occupies the position into which it is forced by its surroundings; it yields to dominating and inevitable circumstances. Change and improvement, must therefore always result from change and improvement of these circumstances. It assumes its natural form and position when released from the causes tending otherwise, as surely as a bent fore-finger, when the compression which causes flexure is removed. The uterus requires no straightening; only the removal of the dominant compressive force. Even adhesions, long binding it in an abnormal position, are gradually but certainly removable by the progressive divulsion secured by the processes pointed out, subsequently carried forward to the perfected degree by restoring the natural rhythm. This force, during sleep, operates without opposition, and continuously to that end. It only requires to be allowed so to operate.

The views set forth in the preceding pages in respect to the efficacy and practical breadth of mechanico-therapeutics for pelvic diseases may be regarded with suspicion, because singularly at variance with current accepted doctrines and practice, and a consequent seeming lack of authentication. The first objection holds equally against all improvements if not against all progress and is therefore actual commendation; while the second disregards the modes of verification of the statements which are clearly pointed out; the testimony of the large numbers, who have been successful subjects of self-cure; and the fact of the practical and successful adoption of these principles by increasing numbers of well educated physicians, who have applied these principles under test conditions. It is proper to introduce a few examples of this latter testimony, to show that my own statements are neither rose-colored, due to defective diagnosis, personal tact or individual magnetism; and that any physician well grounded in the elementary principles set forth in this book can do as well.

Dr. G. H. Patchen, Burlington, Iowa, furnishes the following cases:

DYSMENORRHŒA DUE TO ANTEFLEXION.

"Miss N., aged about twenty, applied in December, 1880, for relief from dysmenorrhœa. The menses were irregular, scanty, delayed, and attended with great pain in the back and hips, and especially in the hypogastric region. The severe pain was accompanied by vomiting, faintness and coldness of the extremities, preceding the appearance of the discharge a few hours, continuing during the first, and sometimes till after the second day. The bowels were obstinately constipated and she was anæmic. The usual remedies were faithfully employed for over a year with very little relief. Physical examination showed a prolapsed uterus with marked anteflex-

ion. Mechanical means to elevate the depressed organs and strengthen the cervix were persistently employed with no decided result. The uterus was so pressed down that it could not be moved in any direction by any ordinary means. The cervix rested on the floor of the pelvis, and all efforts to push up the organ from below seemed only to increase the flexion.

In April, 1883, she concluded to avail herself of the mechanico-therapeutic methods. The treatment consisted of such processes as co-operate to expand the chest, elevate the ribs and lift the abdominal contents from the down-crowded uterus, and allow it to rise to its natural position in the pelvic cavity. So successfully was this done that at the end of the first month of treatment she passed a very comfortable period. No other remedies of any kind were now employed. At the end of the third month she was so much improved that the treatment was discontinued. The uterus now occupied its natural position in the pelvis; was easily movable in any direction by slight pressure; cervix flexible and nearly straight; and the superincumbent weight was wholly removed. The improvement was not confined to the dysmenorrhœa, but included the general health; she was better in every way than for years. She was married the following October and remains well."

The processes for the first month were as follows:

1. Massage of feet, see "Massage," pages 179–180.
2. " " arms, " " page 188.
3. Process 16.
4. " 19.
5. " 40.
6. " 30 and 32.
7. " 26.
8. " 11.
9. " 3.

During the second and third months the following processes were added, directed to the relief of the constipation:

10. Process 22.
11. " 24.
12. " 34.

Dr. Patchen contributes the following account of a case of chronic endometris and retroversion; complicated with insomnia and mental depression, bordering on insanity.

The Doctor relates that the subject of the account had been a former patient for ten years, that she was treated locally and otherwise in the usual manner, but with no permanent improvement: that she had been an inmate of the Good Samaritan Hospital at St. Louis, Mo., with similar results: also under an eminent specialist, of the same place with slight improvement of the womb, but none of her mental and nervous condition: that her husband had been advised by the latter that it was doubtful if anything more could be done, and that the insane asylum would soon be the most suitable place for him. Doctor P. then sought the case as a test of the value of the new treatment to which he had become inclined, and prepared to apply. He says: "She was a stoutly built German woman about thirty-one years old and had been married fifteen years; had been a hard worker and had a large family of children. The date of the commencement of her illness was about four years previous, from the effects of a miscarriage at the third month. On examination the uterus was found prolapsed to an extreme degree, retroverted and very much congested, and measured four and one half inches in depth. There was old but not very extensive laceration of the anterior lip of the cervix.

"She also presented the following symptoms: very weak; restless; could not compose herself; feeling of great weight or heaviness in the head; great anxiety in the precordial region; compelling her to walk the floor, crying and moaning till obliged to desist from exhaustion; slept very little for

the same reason; unable to concentrate her energies; took no notice of her children, although she expressed natural affection when asked; would not be left alone; would run away from home unless watched; had twice attempted suicide; took no notice of ordinary events; but expressed great interest in a future life and anxiety about her soul's salvation. She continually exhibited a wild, staring expression of countenance; never smiled. The appetite was poor; complexion very sallow, bowels very much constipated, and there was general emaciation.

"No local applications of any kind were used and no medicinal remedies: the sole reliance being mechanico-therapeutics. She showed decided evidence of improvement in two weeks; began to sleep, to take interest in passing events, forget her troubles, and would occasionally wreathe her face in a smile. At the end of two months she was desirous of assuming the direction of her long-neglected household, and felt able to do so. At this time the uterus measured one inch less in depth: its size was diminished, and it had assumed a more elevated position.

"After a few months' absence she voluntarily returned to complete the cure, and was in every respect as well as when she discontinued. She said she had regained half her health and came back for the other half. She prolonged this second term to about three months, when she was to all appearances perfectly well. The position and size of the pelvic organs were normal.

During the first term of treatment she received the following processes:

1. Process 40.
2. " 39.
3. See "Massage," Nos. 9 and 15.
4. See "Massage," No. 24.
5. Process 30.
6. " 3.

During the second term of treatment her prescription was as follows :—

1. Massage of feet and thigh, Nos. 9 and 15. See "Massage."
2. Massage of Arms, No. 24. See "Massage."
3. Process 40.
4. " 39.
5. " 30.
6. " 26.
7. Process 11.
8. " 3.
9. " 24.
10. " 35.

XXIII.

Uterine Affections with Nervous Derangement and Prostration of Strength; Neurasthenia.

The form of therapeutics described in the foregoing pages exercises a direct curative control of the causes of one of the most difficult and obstinate forms of invalidism known in medical practice. Reference is now made to that large class of female sufferers, examples of which are found in every civilized community, often long and almost hopelessly confined, perhaps to their beds, and have resisted the most tender and assiduous medical care.

The most prominent characteristic of these cases, is the quality and amount of their sensibilities. The sensory powers are greatly in excess of health, and assume erratic and contradictory forms. This excess, which gives prominence, is intermingled with even greater deficiencies of local parts and functions. Hence, the pathological view taken of these cases may depend on what special feature is brought under review and what is neglected. Partial and restricted cognizance of the distinct parts of the affection, leads to misdirected remedial applications, in opposition to the patient's real needs. As these cases are usually constitutionally predisposed to the morbid enervation which finally terminates in the condition described, the reason for their intractability is intelligible.

The misapprehensions of the sufferer and her friends, which unfortunately appear to be more frequently fostered than corrected by their medical advisers, are of several classes. The tendency of these misconceptions is so opposed to successful remedial management of these cases, that it is important that they be well understood, in the interest of the suffering and of medical science.

These misapprehensions, popular and medical, are of several different kinds, and may be appropriately ranged under separate heads, for greater clearness and better comparison with the true pathology and therapeutics of this class of invalids.

1. The pelvic contents, or some portion thereof, of these hopelessly prostrate cases may be, and frequently are, the seat of considerable morbid change, and nearly always manifest a large amount of functional aberration. There may be leucorrhœa, perhaps abundant or offensive; there may be erosion, ulceration, or hyperæmia amounting to permanent increase of substance of some one or other portion of the generative intestine, and there is frequently severe dysmenorrhœa, to which the utter prostration of strength may have been referred as cause.

The mistake of regarding each or all these local manifestations as a primary disease, instead of the subordinate evidences and outcome of the real cause, has been sufficiently dwelt upon; and it only needs to be repeated here that the local remedies so much in vogue, which utterly failing to reach the source of the affection whatever its form, are liable to seriously compromise the nervous system, and thus directly increase the nervous complications, manifested both locally and in the general system, and in this way afford direct opposition to recovery, as will be shown in succeeding paragraphs.

These patients fail of restoration because little or nothing really promotive of restoration is supplied. Their nervous-

ness increases, because much is done promotive of its increase.

2. The friends and advisers of these invalids are inclined to draw incorrect practical conclusions from the facts of prostration, helplessness and the great deficiency of muscular power which is the conspicuous feature of these cases. It is in the first place inferred that the lack of muscular power is subordinate to the local disease or derangement instead of the reverse. It is in the second place assumed that the increase of muscular power is to be provided for by increase of food. This assumption, while bearing a modicum of truth, leads to such practical errors as effectually to prevent recovery. It is based on a serious misapprehension of physiological truths, which should be corrected in the minds of the patients themselves, as well as in those of their friends.

The faulty reasoning appears to be something like this :— muscular inertia is inseparably connected with muscular innutrition : therefore increased muscular power must be sought in bettering the quality and increasing the amount of food digested.

This reasoning, specious as it appears, is practically delusive and fraught with evil. Digested aliment is not necessarily nourishing to the muscles or any other part. The circumstance of *assimilation* intervenes. Nothing advantageous is effected by the first without the last. Indeed, to digest aliment, or to introduce nutriment beyond the digestive boundaries, that is, into the vital system, there to remain unemployed, is a positive source of ill. Conditions promotive of assimilation are absolutely essential, in the first place to prevent material intended for nutritive uses from producing effects exactly opposite and serving as an impediment thereto ; and in the second place to determine with certainty and precision just what part and what function shall be supported. Aliment has not the least intelligent, self-directive

power, its destiny is controlled and always controllable by the uses to which it is applied.

As these cases invariably suffer from faults of the digestive organs, the attention is necessarily turned to these organs, and the sensations at that point are too often construed as the essence of the difficulty. Digestion hence receives excessive therapeutic regard, as though assimilation could be assisted by compelling an increase of digestive action. The source of ill digestion is attributed to the ill quality of the secretions; but these are necessarily in these cases largely composed of the unemployed nutritive material, unprepared for other modes of exit.

The anxious but unscientific friends of these invalids, not content with employing incentives for stomach digestion, extend their solicitude to the form of even obviating the need of digesting, by supplying nutriment in a soluble form, effecting the solution by means of the digestive secretions of the lower animals.

This recourse, untempered by some concurrent restriction, can only have the effect in the long run of increasing the disparity between the nutritive material supplied to the vital organs, and the material applied to functional uses by these organs; it is hard to find how by such procedures the lacking strength can in any degree become assisted, since the idea of assimilation, and the concurrent processes of elimination and the oxidation necessary for assimilation are entirely omitted. Hence it transpires in reference to the class of prostrate invalids, there is no end of talk about special qualities of food, special preparations of food, special combinations of alimentary substances, increasing the proportion of this, and diminishing the proportion of that constituent; and the infinitely varied devices for introducing more aliment into the system, against which the digestive organs are practically treated as offering impediments.

In regard to this exclusively peptic mode of dealing with

defective nutrition, the invalid should understand that, while the purpose may be beneficent, the peptic method is wholly impracticable , for—

1. Food, including all nutritive support, cannot be in the least degree forced upon inactive and unwilling muscles. Muscles take support chiefly by acting, for it is in this way only that the need of support arises ; the contents of the muscle cell are dismissed chiefly when motor energy is dissociated ; the physical conditions permitting resupply occurs at that instant and not earlier. The abundance of nutritive material in which the muscle fibre is bathed, cannot affect the muscles as to substance or power, since these conditions arise only from *intra*, and not from *inter*-cell conditions. Without securing *first* the interior-cell condition, all other forms of remedial painstaking are wasted or worse.

2. The mistake in relation to the mode securing the much needed muscular strength does not end here. The material actually employed or used for supporting any of the energies of the organic system is no longer resident in the system ; it is eliminated as gas, vapor, water and salines at the instant of dissociation of energy, whether as heat, muscular, or nervous power. Unused materials fail to be directly eliminated. The organic system therefore is a reservoir of substance waiting elimination. The supply of surplus material in the irregular and illegitimate modes of nutritive supply contemplated by the devices above referred to, adds greatly to this inert and obstructive surplus. Injury to the health is inevitable in the following ways : (1.) The parts of the organism which supply little or no local aid to the circulation of the blood, become engorged. The head suffers excess, because, as previously shown, while the action of the brain calls blood into it, it has no power of completing the circulation by returning its blood. Excess of blood in the spine is favored for the same reason. The lying position assumed by the invalid affords a physical cause for its re-

tention by the effect of gravitation to the spine; and the restricted use of its flexibility, (which aids circulation) produces cumulative effects. The pelvis, as before also shown, does not supply in itself the physical conditions for removing its venous circulation, and the mechanism at work to secure this end in health, is in a state of suspense. It is hence easily understood why endeavors to improve the defective muscular strength above noted, result in all the evils of overfeeding, as regards inflammatory and congestive tendencies, but with the fatal disadvantage of having these tendencies previously located.

3. Pelvic affections are inevitably associated with pain, which vehemently calls for relief; if not upon the physician, then upon whatever may even promise that boon. A misinterpretation of the indications thus supplied, is a serious error, leading to unending pathological consequences; and interposes an obstacle, frequently fatal to recovery. The philosophy of this indication is perfectly intelligible to the patient, and its understanding is essential to recovery, especially in advanced cases.

Whatever else pain may be it is a form of energy, which correlates with other forms, especially the muscular. It is excess of manifestation by nerve centres, and of the nutrition of these centres; and defect of manifestation by muscular substance, and of nutrition of its substance. Pain detracts from the amount of other forms of manifestation of energy by the organism, as every one knows who has suffered it in decided form. If pain be prolonged, unequivocal diminution of muscular substance is certain to follow. The demonstration of this inter-relation is rendered complete by the subsidence of pain, on introducing rapid nutritive or intra-cell muscle-change. The practicability of securing this effect is clearly shown in this volume. The legitimate way of conquering pain is simply to supply by art the nutritive relations which exist in health when pain is absent; to supply designedly

and purposely, the conditions which in health reign spontaneously. This consists in regulating the relations of metamorphosis of tissue so that of nerve and muscle shall sustain their natural equipoise and inter-dependence.

It is easily seen that the conclusions of the sufferer and those agreeing with her as to her real needs may be exactly opposed to the facts; and that the remedies commonly employed and designed to affect the nerve substance, have little effect in diminishing pain. The power of such remedies as relates to pain is limited to its postponement, by temporarily suspending nutritive support of the nerve centres whence the pain emanates. The nature of this effect appears to be in the main inhibitory; it continues during the presence and contact of the medicament with the source of pain. Being removed through the ordinary physiological processes, the pain returns because of the return of the nutritive activity of its source. The reappearance of pain is often in less bearable form. The return of nerve nutrition is denoted by the increase of disagreeable sensations; the cause of pain has not been diminished; the action by which it is evolved has only been temporarily suspended.

Whatever may be said of the necessity of sedatives in medical practice, with which in general, as relates to emergencies, I agree, there can be no doubt but the function of this class of medicaments is abused when called into habitual requisition. This is because of their power to increase the nerve nutrition to a morbid extent; the energies developed become relatively excessive, and affect the consciousness constantly more disagreeably: that is, these energies assume more and more intense forms of pain. The nerve centres are raised above the muscles in nutritive importance; the currents of nutritive support are directed vehemently *to* the acting parts which are nerves; and *from* the inactive parts, which are muscles. The counterpoise in the distribution of the energies arising in the organic system is destroyed.

Practical experience confirms the above statements. None are so nervously irritable and disquieted as the habitual users of nerve-quieting remedies, whatever their form or nature. The same individuals are for that reason muscularly weak, and devoid of manly and womanly courage.

Even well-balanced and healthy persons soon betray the same characteristics after falling under the habitual use of this class of drugs; evidently because the habitual incitation of nerve centres causes unbalanced excess of their nutrition, and diminishes that of the instruments of dynamic energy, the muscles. The cerebral substance and that of the spinal cord necessarily suffers a low degree of hyperæmia, from the proneness of these organs to respond to even trifling causes of incitation.

One physiological circumstance serves to diminish the consequence stated. In nature, it opposes restraint to all functional excess. This is the heat production quietly effected by the muscle-cells, that is always slowly going on in the organism. Even in absolute quiet, the muscle-cells are slowly transforming nutritive matter and disengaging heat. It is plain that this action is diffusive, and in its ordinary working, restrains excess of nerve energy, by the demand of the system for heat energy.

But the unphysiological treatment of this helpless class of invalids prevents the due effect of this spontaneous correction, for such invalids are liable to suffer injurious diminution of this diffusive influence, by the measures of mistaken kindness assiduously employed to *prevent* heat production by the muscles. Patients of this class are enveloped in clothing and subjected to heat applications in all feasible ways, all of which can have no other effect than to restrain the production of heat, and therefore to force a still greater disproportion of nutritive supplies upon the already overwhelmed cerebro-spinal centres.

The peculiar personal habits, prejudices and tendencies of

the class of invalids now under consideration still further confirm the view here presented. They are little disposed to muscular action and their muscles suffer sadly from disuse. They are emotional in a high degree: disposed to insomnia, to excess of sensibility under the least provocation. They are emphatically subjects of neuralgia. The remedies they choose, correspond in their nature to the forms of power they manifest.

It is very common for these invalids to suffer excess of some special sense. Some have photophobia, and require a darkened room. Others require to be removed from the reach of sounds and noises of all kinds. Still others suffer from extreme exaggeration of common sensibility at different segments of the body, as the side, the head; or some special part of the spine, as the neck, the loins. The sensory manifestations and the muscular feebleness in almost all instances are more marked on one side of the body than the other. The condition of sensibility as a whole is indicated by the term *hyperæsthesia*—excess of sensibility, without reference to its local points of manifestation.

The prostrate invalid, with severe local pelvic suffering may therefore understand that the source of her malady is perfectly intelligible, and that its remedy depends largely on the co-operation of her intelligence. The chief points to be noted are these:

That the pelvic disease and the general and local hyperæsthesia depend less upon each other, than upon a common cause, adequate to produce either effect, or both.

That this source is inferiority in the relation the muscles assume in the vital system. This inferiority prevents adequate rhythm, causes defective change of matter by muscle cells, insufficient heat, and allows hyperæmia or excess of blood in such local parts as are incapable of providing for the local circulation. Hence, the contents of the pelvis suffer co-incidently with the nerve centres; hyperæsthesia

and local congestion becoming different effects of the same cause, operating through different anatomical or structural, as well as functional channels.

That the true physiological remedy for excess of nerve irritability, and consequent excess of nutritive support of nerve substances is increased nutritive support of muscle. It matters little how the nerve excess is manifested, whether as local neuralgia, excited emotions, or hyperæsthesia, general or special: excessive evolution of nervous energy indicates corresponding need of muscular incitation as the natural means for its repression.

That whatever be the practical use or the theoretical value of the so-called nerve remedies usually prescribed as sedatives for the cases now under consideration, they have no therapeutic relation to the ultimate causes of nervous irritability. On the contrary, an opposite effect from that desired is certain to follow their use. This is because of their disturbing interference with the nutritive support of nerve centres from which nerve energy physiologically emanates.

If the primary effect be stimulant, the nerve centres become the local point of nutritive activity. If it be repressive, or inhibitory, this nutritive consequence is merely postponed, but is sure to follow. Any case of addiction to morphine, chloral, or similar drug, will afford abundant evidence of the correctness of this statement. The general proposition that nervous manifestations are increased and muscular power proportionally diminished by this means is conclusively demonstrated by every case of the kind. Nerve remedies so called are to the nerve centres, what exercise is for the muscles; the local and functional nutrition of these instruments of power are, in either case, increased.

It therefore follows that the proper remedy for habitual excess of nervous manifestation, at whatever local point, must consist of such measures as incite muscular nutrition. This is theoretically the mode of combating morbid excess

of nerve activity, even when its conscious form is that of *pain*. Practically, this statement admits successful demonstration.

The general principle constantly urged in this work reappears at this point. The nutritive support of each and all segments and functions of the organism is conditioned by *use*. Whatever promotes change of the interior of the nerve cell, evolves its energy in *some* form, agreeable or disagreeable to the consciousness. Whatever causes the same effect in muscle cells, increases their functional preponderance: the available power of the organism is depressed by causing it to flow in restricted channels, because the conditions for nutrition are depressed.

Neurasthenia.—The cases of physical prostration accompanied, as it nearly always must be, by erratic nervous manifestations, have often of late years been included under the classification known as neurasthenia. By this term is indicated defect or restriction of nervous power.

The symptoms are extremely varied, and include a large number of manifestations of irregularity, rather than diminution of nervous power. Nervous invalids speak of their feelings as *nervous prostration*. These include local neuralgias, of varying type and location, with irritable, often hysterical symptoms. The most characteristic symptom, probably, is rapid decline of energy, nervous and muscular under exertion, or use of the will.

In the light afforded by preceding statements of physiological principles, the view which regards the condition referred to as based on lack of nerve energy is a mistake, and the name thus applied is a misnomer, and arises from a total misapprehension of the real nature of these cases. The therapeutic inferences and practices based on the usual conception of the term, are fraught with highly mischievous consequences; and the term, neurasthenia, as applied to these prostrate cases, is an egregious misstatement of fact. To the commonest observation it is evident, even were there

no proofs to the contrary, that pain is the presence and not the absence of nervous power; and that emotional manifestations are the product of far greater expenditure of nervous energy than calmness and quiet. There is no evidence of lack, but much of too abundant, although incoördinated, nervous energy. The excess of manifestation is misdirected, and falls short of utilitarian ends. All and singular of these nervous manifestations, however erratic, are the outcome of nutritive support of nerve substance, and are entirely dependent on such support; they are absent in the absence of such support. Such absence, in the curative sense, is procurable by simply diverting nutritive support to other parts, or through other channels.

It follows that the prostration of strength, the general incapability and the pain which these invalids suffer, do not in themselves afford conclusive evidence of lack of power in its absolute sense, but of *muscular* power. The defect is dynamic rather than nervous. Considering the little use this class of invalids have for nutritive support of muscular action, and their usual very great caution against loss of energy in the form of heat, they digest and assimilate a reasonable amount of food. They are necessarily dyspeptic, as all must be who lack normal incentives to respiration; but often a portion of the sensations referred to the digestive organs, indicate local hyperæsthesia as well as faulty digestion; the subjective symptoms are disproportioned to the degree of indigestion.

The mischievous consequences of a misconception of the real nature of prostration, often called nervous prostration, consist in the abortive attempts to stimulate, and in various ways to incite and to specially nourish the nervous system, to which misconception leads. Untempered by opposing circumstances, the therapeutics acting under this idea are sure to increase the difficulty, by rendering the nervous functions, already paramount in the system, still more abnormal.

Even a correct conception of the nature of these cases will not infallibly lead to correct therapeutics, especially if the desired preponderance of muscular nutrition is sought through exercise. The instincts of these patients to forbear exercise accords with their experience. Even attempts at exercise are liable to be injurious. This is because the muscles, being weak, are on that account less amenable to incitation from the nerves, and therefore require a more energetic nervous influence to secure any given degree of muscular effect; a physiological cause above shown to be repressive of muscular nutrition, while encouraging that of nerve centres—an effect exactly opposite of that sought and desirable.

The exercise of the healthy, and that of laborious occupations, produce on the other hand an equal distribution of muscular and nervous nutritive support, because the nervous incitation and its muscular consequences are coordinate, proportional, and natural. The muscles are receptive of nutritive support, but the nerve centres are less so than in the morbid condition, when the latter are on the verge of hyperæmia, and respond with unnatural vigor to the least incitation; this is necessarily followed by corresponding depression of nutritive activity, and of the special energy flowing therefrom.

The above described condition of the nervous system as related to the muscles is utterly incapable of self-rectification. This event must be brought about by art. The conditions are first, the permanent restraint of nervous incitation from all sources, so as to check the unnatural nutritive support of the nerve centres; second, artificial incitation of the masses of muscle cells, so as to increase their nutritive changes beyond their present, and even beyond their ordinary function.

While the nutrition of nerve centres is so easily modified by the direct action of drugs, a fact readily taken advantage of by the therapeutist in unnumbered ways; the muscle cells

enjoy singular immunity, and are nearly unsusceptible to direct effects of medicaments. Muscular actions are secured through the nerves, as we have seen; but these should be restrained, to secure special therapeutic effects. There is no drug available to incite muscle nutrition as its direct effect. Muscular spasm, through artificial nerve incitation, is of an opposite character, being only the reflex of over incitation of the nerves. The condition demanded by correct therapeutics, is the temporary *absence* of nerve incitation, so that the whole power and value of the available energy of the organism may be concentred on muscular nutrition, in extreme contrast with its constitutional and acquired tendencies.

The supply of mechanical energy to the muscle cells and muscular masses fulfils the conditions of cure. Such transmitted energy is transformable, and becomes a direct aid to muscle nutrition, while producing not the least effect in promoting that of the nerves. The former class of tissues therefore rapidly rise to be equal in function to the latter. This is the fundamental condition of health.

The treatment by transmitted energy complies with the demands of science, and is therefore scientific for the following reasons:

It deals with the forces which control matter throughout the known universe, instead of the reverse of this proposition.

It relates to the equivalents of different forms of energy, a principle well understood outside the domain of physiology, and now proved to reign within its sphere also.

It imparts energy into the vital system, instead of calling upon vital structures to dissociate their constituent elements, to cause the liberation of the desired energy.

It secures local nutritive action at one part to depress local nutritive action at another, an effect which becomes self-perpetuating; a proof of its consonance with vital laws, which are doubtless also those of science.

Mechanical incitation derived from mechanical sources of energy, fulfils the principal conditions for the scientific therapeutics of these cases. The form of therapeutics mainly indicated, is known under the general descriptive name of Massage. There are two principal methods, the manual and the mechanical, required and practised.

To make still clearer the nature of the proper remedial methods to be pursued for the large class of prostrate invalids who are nearly always disappointed in their expectations of restoration by current methods, a typical case may be presented. The actual, as distinguished from the apparent, pathology of these cases requires considerable discussion and illustration to be properly understood.

Mrs. Y., an only daughter, was reared with the utmost tenderness, carefully shielded from every demand for effort, and from the rough side of the world in general. This, it may here be remarked, is not the practical way to develop the power of self-help, and the power to resist the intrusion of exterior impressions of any sort. At twenty, was married. Eight years thereafter she became my patient. She had then been confined to her bed most of the time for the two last years, having suffered the usual varying symptoms referred to the pelvis. There was retroflexion with immovable fundus of the uterus. There was excessive hyperæsthesia of all the contents of the pelvis; examinations were followed by weeks of nervous prostration and pain, and were therefore deferred beyond all sense of professional propriety. The morbidly acute sensibility was far from being confined to the pelvis, but extended throughout the system, affecting particularly the organs of special sense. Wherever she was taken for change of air, as at the seashore, the utmost care was taken to secure as perfect isolation as possible, often involving the necessity of engaging several adjoining rooms, or a cottage, to secure distance from ordinary noises. Photophobia, which was also a feature of the case, required darkened rooms,

Her emotional activities were equally as acute as were the special senses. Obstinate constipation, indeed, absence of natural discharges from the bowels without special forcible means, was the rule; and there was painful piles, increasing the dread of action of the bowels. Defection was also followed by prolonged prostration.

During this time the chief interest of her medical attendants had been centred in the malposition of the pelvic organs, and the local evidences of congestion or hyperæmia, which, notwithstanding, became actually worse, while perhaps, seemingly better for transient periods, after the employment of each new local medical recourse.

In opposition to the dictates of the feeling of the patient; in opposition also to the almost uniform decision of gynecologists, the principles now shown clearly prove that neither the rectification of the position of the uterus, nor direct depletion of the local pelvic hyperæmia, are the primary remedial needs of these cases. To correct the malposition is of comparatively trivial importance, because such correction is not self-continued; this effect can be made constant only by rendering constant the power of supporting the uterus. Pessaries and similar contrivances do not even aim in that direction. So also local depletion for removal of congestion, be it ever so complete, effects comparatively nothing so long as the same conditions favoring its immediate recurrence remain in unimpaired force.

The processes of massage, as described in the present volume, also in my work of that title, control the disposal of the nutritive support of vital organs, increase the support of selected or special muscular parts, and secure corresponding diminution of nutritive action of such nerve centres as are related to the suffering location and to the whole organism and its consequences.

It is of no practical utility to task the rhythmic, or any other muscles, with either the duty of sustentation of the pelvic con-

tents, or the removal of local hyperæmia, till their nutritive activities are called into exercise and re-enforced. Efforts thus directed are ineffective and transient.

The case under consideration was subjected to the *massage* processes as described in the volume above referred to, while lying on her very soft bed, which, however, had to be transferred to a narrow couch for convenience of access by the *masseuse.* The general directions of the book referred to were strictly followed. Care was taken that the processes were so adjusted in kind and degree as to be agreeable to the patient's feelings. The form and manner of the processes are far from being matter of indifference. In a case like this the nerve-endings in the skin must on no account be traversed by the hand or the instrument. The skin must in all cases be so compressed as to move with the moving instrument, even though this be the hand of the masseuse. An operator uninstructed in this principle, easily becomes an agent of ill effects brought about by incitation of nerve-centres from peripheral impressions.

The following processes in the order noted were employed. The special processes are designated by numbers, and the manner of applying these processes will be found under the respective numbers in the book "Massage," to which the reader is now referred.

1. See "Massage," No. 9.
2. " " " 24.
3. " " " 13.
4. See "Massage," No. 24.
5. " " " 26.
6. " " " 23.

After a few days the following processes were added: "Massage," Nos. 1 and 2 each side the spinal column.

To properly understand the form and mode of applying massage, in reference to the nervous condition of similar invalids, the reader is specially desired to review what is said in "Massage" on this subject. He will there find explained the difference in effects between massage limited to the skin, and failing to reach the muscular tissues beneath it, and

that confined to the muscular tissues, while the skin is unaffected. The former process consists in traversing the surface with the operator's hands; the latter process does not traverse the surface, but by compression compels the skin to move with the hand. By the first mentioned method, the skin and the nerve-loops terminating therein are chiefly affected. The superficial impression is a powerful natural incitation to nutrition of nerve centres, already too irritable. This form of the process is highly injurious to the class of cases to which the instance now presented belongs. The other methods of applying the process, by which the nerves are *not* traversed, and the nutrition of the spinal centres are *not* incited, produces exactly opposite effects. The nutrition of muscular substance is increased, while that of the nerve centres is positively diminished. These effects, which I have called *functional revulsion*, (to distinguish from the old methods of counter-irritation) are unequivocal and permanent, and may be relied on in the curative treatment of the nervous class of invalids, whatever be the special modes of manifestation of nervous hyper-irritability.

The remedial effects of the daily application of these processes, occupying about an hour and a half, were soon conspicuous, in diminution of general hyperæsthesia, indicating increase of muscular nutrition and the power of the muscle cells to transform food, produce heat, and afford muscular power. In three weeks the invalid was placed in a carriage and conveyed to my treatment rooms, where, though still unable to walk, she was enabled to receive more appropriate treatment receiving the following processes,

1. Massage No. 9.
2. Process 40.
3. " 39 or 37.
4. " 38.
5. " 35.
6. " 8.
7. Process 16.
8. " 3.
9. " 26.
10. " 30.
11. Massage of back.

New evidences of improvement were soon apparent, specially indicated by diminution of hyperæsthesia. Directly she obtained permanent control of the bowels, which for a long period had only acted in response to the enemata, or some other local or medical incentive. She now began to walk about the house. The massage processes were gradually displaced by those which more actively engage the will. In four or five months she was able to enter into the ordinary interests and enjoyments of life. The retroflexion was not even at this time entirely absent, but the pelvic contents occupied a position so much more elevated, that the uterus had long ceased to afford symptoms of any kind. This fact was, however, due in part to the removal of pelvic hyperæmia, which is also another and equal consequence of the processes employed. Stenosis, one of the effects of retroflexion, is very early removed by the treatment and should be continued in a modified way during the periods, to secure the best effects, however prostrate the patient.

Mrs. Y. has resumed her place at the head of the family and mistress of her house; and though a weakly woman naturally, enjoys very good health. It is due to say that the correction of the retroflexed uterus goes on progressively, with and after the restoration of health, so that it may be safely stated as a general principle established by my experience that the normal anteversion will have been acquired in about a year; a longer period may of course be required in obstinate cases of general weakness. In explanation of this statement it should be kept in mind that the corrective cause, newly brought to bear on the condition, acts continuously, not only through the day, but is particularly efficacious during the sleeping hours, as then there is neither gravitation, nor mechanical or nervous opposition to the full, profound lifting effect of respiratory rhythm.

The process of restoration is, therefore, the exact reverse counterpart of the conditions through which malpositions

are acquired. As in the one case there is gradual decline of the powers of sustentation and of the causes operating to maintain the return pelvic circulation, till the local manifestation may, perhaps, become suddenly obvious to the senses; so health returns by the gradual and certain reinstatement of the controlling conditions.

It may be of service to the anxious invalid to know that the form and name of the nervous complication, and the location of the centre of nervous irritability and hypernutrition, may be quite dissociated from special pelvic manifestations. These subordinate objective and subjective facts are due to subordinate causes, which may in some cases be fully identified and appreciated by the patient and the physician, but frequently are not of a kind to admit of intelligible explanation. The patient may rest in the assurance, however, that the morbid increase of nervous activity is conclusive evidence of morbid decline of the power and habit of the muscles to effect physiological changes in the material with which the system is supplied; that the true pathology of these cases consists in misdirected energy, entirely susceptible of correction by an intelligent apprehension of physiological first principles; and that these propositions and statements are as far as possible from expressing a theory, but are conclusions to which any one will easily and certainly arrive who avails himself of opportunities to learn the facts.

COINCIDENT DISEASE OF DIFFERENT PELVIC ORGANS; RECTAL FISTULA.

THE reasons why the consequences of the physiological defects which have been pointed out as the usual source of disease pertaining to the base of the abdomen and pelvis, should usually be found in one, instead of all the parts exposed thereto, have been referred to. These reasons may be grouped in two classes, the mechanical and the functional.

The former includes the fact that the mechanical yielding of any part, diminishes the effect on contiguous parts of gravitation, by guiding it to the yielding point. The other relates to precedence of function and its influence on associated functional activities, whether these be normal or otherwise. In either case, the location of the effect is due to subordinate causes; but removal of these cannot affect the paramount causes. It has been shown that all these varied local manifestations, whether positional or functional, are traceable ultimately to the physiological conditions under which organic rhythm operates, and are controllable through the control of rhythm.

The co-existence of uterine dislocation, piles, and fistula, which includes organs and functions entirely unrelated except topically and mechanically, can hardly be satisfactorily accounted for, except through the common mechanical bond connecting them. Why then should not therapeutic effects be sought through the bond which unites these morbid conditions? What other than the mechanical remedy even recognizes the etiological facts common to the several diseased manifestations; and what other remedy can be found which extends to, and has a philosophical relation with, each of these parts alike? If mechanico-therapeutics should be found in fact to control these mechanically related parts as one, even in their pathological condition, the conclusion becomes irresistible that wherefore much more may the same recourse be adequate for the therapeutic indications of the several parts, when these parts are morbidly affected in different individuals.

Cases which include coincident disease of different parts occasionally appear, and are highly instructive as illustrative of the views of pathology set forth in the present volume. A notable one is that of Mrs. N., about thirty-five years old, of New York. This lady is a light blonde, tall and thin, has very little muscle, and is of a highly nervous temperament; has

been married fifteen years and has two children, the last several years old. For five years past she has been under the care of different physicians for various local affections of the pelvis and spine. It was for the latter affection that she was led to consult me. I found her spine exquisitely sensitive to the touch throughout its length; the head constantly suffered severe neuralgic pain, accompanied by great depression of spirits, insomnia, and mental unrest; the neck and back nearly to the waist were intolerant of even the gentle touch of the fingers. There was also a great deal of intercostal neuralgia. Within a year she had suffered excision of piles, with which she had been long afflicted. These however had now reappeared and were as troublesome as before, and she was on the point of suffering a repetition of the operation when she called on me. Also within the year, after enduring much pain an abscess broke just at one side of the anal sphincter; from this there had ever since been a constant, abundant discharge, of thinnish, sometimes sanious, matter. She felt this to be a constant drain upon her vital resources, and no improvement in the amount or character of the discharge had been noted. The external opening of this fistula projected considerably beyond the level of the surface through which it emerged. Her whole appearance was wan, and that of one scarcely able to be about.

The first prescription (occupying three hours in its application) was as follows:—

1. "Massage," pages 179–80.
2. " page 188.
3. " " 182.
4. Process 40.
5. " 37.
6. Process 38.
7. " 35.
8. " 3.
9. " 26.
10. "Massage," pages 163–166.

Having in about ten days experienced great relief in all the many particulars of her many-sided affection, her prescription was advanced as follows:

1. Process 40.
2. " 37.
3. " 38.
4. " 3.
5. " 16.
6. Processes 30 and 32.
7. Process 25.
8. " 24.
9. " 20.
10. Spine massage.

In four weeks the uterus had ascended three inches, as indicated by ordinary touch; the piles had entirely disappeared; indeed these, which had been as annoying as any part of her affection, ceased to afford trouble, almost from the beginning. The fistula almost entirely ceased to discharge, it appearing only at intervals of days, and the quality of the discharged matter had changed to laudable pus, in very small quantity.

Having at the end of a month become able to attend to her long neglected domestic and other duties, her attendance on the treatment was reduced to one day per week, with considerable irregularity at that rate. When the total time of medical treatment amounted to six weeks, she announced that the fistular discharge had for several days entirely ceased, the exterior projection of the sinus had not only disappeared, but a depression of about half an inch had taken its place, and she was no longer conscious of the existence of either constipation, piles, fistula, uterine prolapses, or indeed any pelvic difficulty whatever.

Rectal fistula, it is well known, has generally been regarded as curable only by surgical procedures; and I confess to have shared this conviction. The preceding account however, proves that even bad cases of fistula, in common with displacements, and other diseases relating to the contiguous parts, are perfectly amenable to treatment whose primary purpose is to remove the cause.

The rational presumption is, that the inner orifice of the fistula became quickly protected against the entrance of foul matter, and the sinus was thus allowed to heal. The fold or sack of the mucous membrane of the rectum where

the sinus had its origin, was evidently obliterated by mechanical straightening of the intestine, operating from above, much as obstinate rectal constipation is removed, as has previously been shown.

No more conclusive evidence of the positive lifting of the visceral organs is needed, than the rapid and certain disappearance of fistula. This method secures, with ease and comfort, effects otherwise equivocally and imperfectly attained by means of painful operations, often requiring more or less prolonged confinement. The disease regarded as effect, is abolished by removing the disease regarded as cause, just as are displacements of the female pelvic organs; and the specific local consequences arising therefrom are too often regarded and treated as the only factor of pelvic disease. These secondary effects of straightening as well as raising the parts suffering the consequences of the weakness which allows mechanical displacement, is fraught with incalculable advantage to medical practice, whenever and wherever there is a disposition to render mechanico-therapeutics available.

Mechanico-therapeutics proves that abscess and fistula of the rectum are fairly traceable to defect of rhythm; it fails to extend through the digestive organs to their lower portion. Rhythm and sustentation are so closely connected as to be inseparable. They prevent that persistence of rectal folds gradually distending into permanent sacs, which retain feculent matter, to irritate and inflame; and being beyond reach of ordinary remedies can only completely yield to the removal of the cause. This is done by simply straightening the rectum, by force and tension applied above it.

From the facts and explanations now given, it is easily understood that a variety of morbid effects, which on superficial survey may appear contradictory, may arise from a common controlling cause; that these effects inevitably disappear on the removal of such cause: and that remedial treatment

addressed with a proper understanding of the causative factor, is certain to eliminate the consequential and subordinate factors, however varied these may appear.

Hæmorrhoids. Bleeding Piles.—The efficacy of the mechanico-therapeutic methods described in Part II. for removing bleeding piles, affords a conclusive demonstration of the searching power of the remedy, and its adequacy, not only for lifting the pelvic mass to the more elevated position, but for withdrawing the sluggish contents of the pelvic as well as the rectal vessels, whose detention is the rational source of the morbid catarrhal and sanguinolent discharges so common in the female sex, and which are apt to be mistakenly regarded as separate and self-existent diseases. The cure of bleeding piles by mechanico-therapeutics affords the same unequivocal demonstration of its power, and the control it has over the fluid contents of the pelvis, that the cure of hernia by the same means, affords of its control of displacements of any and all of the pelvic contents. The therapeutic method gives in both cases the same occular proof of its remedial effects; and by inference, of similar remedial control of parts less exposed to view. The great importance of this principle of therapeutics, and the wide extent of its beneficent applications, justifies the presenting of even a multiplicity of examples, illustrating and enforcing the application of principles which are of equal service to the physician and the patient.

Several years ago a well-known clergyman, the originator and promoter of one of the most noted and successful charities of New York, consulted me in reference to *bleeding piles*, with which he had been long afflicted. He asserted that he did not remember that a day had passed during the last twenty years in which he had not suffered from rectal bleeding, in spite of the multitude of remedies which he had in the mean time employed.

This constant drain upon his vital resources had made him pale and weak, and suffer a constant feeling of exhaustion and uncertainty. After ten years of this combined work and suffering, by advice of physicians and friends he retired to a quiet country place to recuperate, by the aid of plenty of exercise in the open air, for which opportunity was definitely provided. His old trouble continued, notwithstanding great improvement in his general health. After several years he returned to the city to resume charge of a charitable organization similar to that he had left. His strength soon run down; the old hæmorrhages increased in amount, and their effects were consequently increasing in seriousness; and this was the reason that at the instigation of friends, who knew of the efficacy of our methods in these and similar affections, he came to resort to our treatment.

The processes employed were very similar to those previously presented, which may here be generalized as a further guide for inquirers. The beginning should usually be with oscillation of the lower, and perhaps the upper extremities; next, processes to produce semi-active expansion of the chest; then such processes about the thighs and lower part of the abdomen as would as thoroughly engage the muscles of the region as the strength of the patient will allow; after this, whatever processes suited to the strength, as must engage the muscles of region of rhythm, the *intermediate* region of the trunk; at first entirely passive, afterward with progressively-increasing participation of the volitions; this is followed by entirely passive work on the whole digestive mass, urging the mobile contents of the abdomen toward the diaphragm; the patient lies in such position as to fix immovably the lateral walls of the chest, thus preventing them from participating in the respiratory act: this act is effected wholly through the diaphragm, and of necessity includes in its upward motions, the extreme contents of the pelvis, the whole

being lifted. The fluid contents of the pelvic organs are submitted to an upward impelling force, and the complete drainage of the different organs is effected preparatory to removal of supplies through the arterial circulation.

The time required by the several processes will vary from one to five minutes for each except the last, the kneading, which may extend to fifteen or even thirty minutes, with increasing advantage. The intervals between the processes should not be less than five minutes, and in general the effect is increased more proportionally to the length of the intervals than to the length of the processes. The permanent good effects arise from the superinduced physiological activities, more than from the immediate action.

If necessary, the effects thus attained may be qualified and strengthened by processes, the nature of which is explained in "Massage," Chap. XV. The patient is thus put to rest, often to sleep, during which the nutritive effects of the several processes of the series become a permanent physiological record. The rhythm of respiration progressively descends, to include the lowest and remotest portions of the contents of the cavity of the trunk; the gliding of the visceral organs becomes established; the contents of the venous capillaries, especially the remotest twigs of the portal vein, are urged on their course; the obstacles to general nutritive absorption are removed; this extends to the rectal vessels; the system becomes better nourished and strengthened with less food, because the blood pursues uninterruptedly its proper channels, and is applied to its correct uses.

The hæmorrhagic losses of our patient wholly ceased in about a week, not to return. The cessation was not a consequence of closing the avenues of escape, but of opening even freer channels in other directions, and of applying nutritive support to its proper uses. The treatment was continued about one month, when it became evident that the assisted im-

provement had become self-perpetûating. No return of the old affliction has been reported; the patient had acquired command of the pathological situation, and could easily reinstate any physiological lapse which might incautiously be superinduced.

As previously demonstrated in the case of fistula, to raise the abdominal mass tends to remove abrupt curves of the rectum. This organ is not sufficiently bound by its peritoneal covering to hinder this mechanical consequence.

From a knowledge of the power of the appropriate processes to lift the abdominal and pelvic contents, the inference is direct that the rectal portion of the intestine suffers a removal of its folds, which impede the return circulation from the hæmorrhoidal veins. The rectum in active hæmorrhoids, is comparable to an arm, ready ligated for venesection. The folds, and the compression of the gravitating mass above, supplies an equivalent to the ligature. The distended and thinned walls of the superficial venous vessels of the mucous membrane, readily yield to the interior pressure, and the blood escapes.

The obliteration of these bleeding tumors by local applications, it is plain can have no effect on these causes, and has no power even to reach these causes. The causes remain as affluent as before, of equivalent if not the same form of consequences. Other twigs of the same hæmorrhoidal veins may possibly fail to become varicose, but the causative factor remains, and so there must, of necessity, be equivalent, though perhaps less demonstrable effects.

The other factor of hæmorrhoidal affections has been referred to on a preceding page, and more at large in "Massage." It is a co-resultant of defective respiratory rhythm, and consists in imperfect and uncompleted oxidation, denominated in the work referred to, *sub*-oxidation. The waste involved by this class of hæmorrhages appears to be a part of the

means of the organism to adjust itself to its chemical imperfections. For, evidently, the venous losses tend in a crude and unwholesome way, to restore the imperfect balance between alimentation and elimination or waste, but do nothing whatever to remove the causes thereof. An actual remedy simply obviates the occasion for hæmorrhoidal discharges, —substitutes health for the special evidence of ill-health.

THE END.